The Magazine of the Registered Professional Engineer

American Engineer

NOVEMBER 1958

New York City Engineers Supervised a $2,000,000,000 Post-War Achievement: A Huge Hospital Construction Program. Shown Is Bellevue Hospital's New Nurses Quarters.

Municipal Engineering Is Reported on By New York City's Commissioner of Public Works. *Starts on Page 17* ► ►

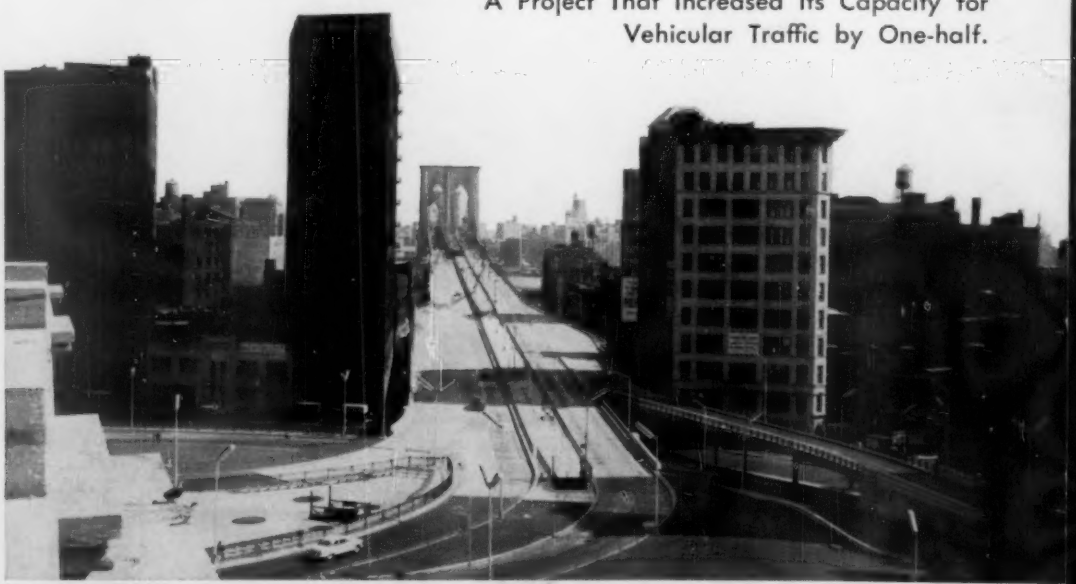
• • •

A Consulting Firm's "Time Bank" Project: Professionalism and Engineer-Employee Welfare Working Together. *Page 23.*

• • •

Plus Late Washington Report . . . Professional News.

Famed Brooklyn Bridge Came in for Modernization by New York Engineers; A Project That Increased Its Capacity for Vehicular Traffic by One-half.



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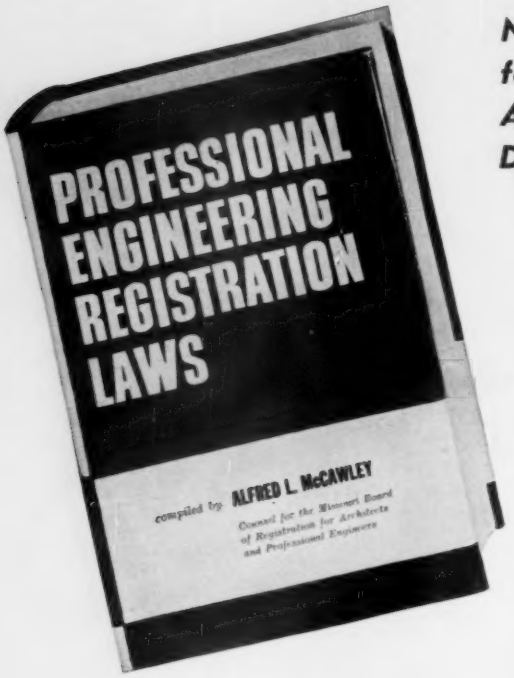

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Engineering Digest
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The Author

Alfred L. McCawley, a Missouri State Senator for many years, is the author of numerous published articles on professional registration for engineers and architects. A sponsor of the Missouri securities law, he is counsel for that State's Board of Registration for Architects and Professional Engineers. His legal career dates back to 1900, when he was admitted to the Missouri Bar.

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Letters to the Editor

"From Washington" . . .

Dear Editor:

It is not fair to read month after month the page "From Washington" in the AMERICAN ENGINEER without letting you know how much it is enjoyed—it is highly readable and a most succinct coverage of the timely points discussed each month.

GEORGE M. NORMANDY, P.E.
Atlanta, Ga.

Flanders' Article . . .

Dear Editor:

Mr. L. L. Simler's criticism of Senator Flanders' article (Letters, August, 1958) on education appears to be based on Mr. Simler's experience with the American educational system only, which is of course simple, but a poor basis of judging and comparing European education.

WALTER W. OFFNER, P.E.
San Francisco, Calif.

One or the Other . . .

Dear Editor:

I have read, with interest, various comments made regarding the engineers' strike and the aspects of unionism in engineering, as reported on page 22 of the September, 1958, issue of AMERICAN ENGINEER.

From time to time, one sees various articles on unionizing engineers, and reads where, in certain organizations, engineers do join a union.

There is much talk among engineers of becoming professionalized, independent, and community leaders, such as are lawyers, doctors, and architects, together with business executives. This, however, can never be possible if the engineer is going to join or become a part of a union since one cannot be a professional man and a union man at the same time.

Elementary and high school teachers find themselves wanting to be recognized and paid as professional people, yet they bargain and pressurize school boards as a union.

Until such time as engineers and teachers make up their minds to be either professional people or union people, they are going to be neither, and the engineering and teaching professions, and the people benefiting by the knowledge of these professions will suffer.

If one wants to be a professional man, he must act and think as a professional man individually, relying on his own knowledge and ability to carry him through to any goal he may wish to obtain.

D. W. Retzinger, P.E.
Milwaukee, Wis.

More on Flanders . . .

Dear Editor:

I was very much interested in the article by Senator Flanders which appeared in the . . . AMERICAN ENGINEER. This article is very timely and thought provoking. It should do much to center attention of engineers on our educational dilemma. . . .

WILLIAM N. RICHARDS, P.E.
Scranton, Pa.

Italian Engineers . . .

Dear Editor:

In the June issue of the AMERICAN ENGINEER . . . an article entitled "The European Engineer and His Education" . . . consisted of a general description and a separate factual report on the education of the engineering profession for most European countries. Mention of several European countries and their engineering education was omitted.

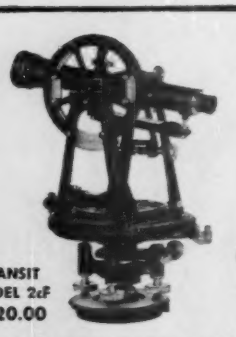
It is a normal human reaction for a reader of this article to believe that countries for which no report appeared must have low standards for engineering education and professional engineers of little competence.

Being of Italian origin, the writer is very much interested in the omission mentioned of the Italian engineer and his education if for no other reason than the following: if the inference by omission is that the Italian engineers and their education are of no importance it is, therefore, to be deduced that the competence and ability of an engineer of Italian origin anywhere is to be doubted. We do not see any reason why we should labor this point any further.

Since the omission in this case pertains to a country whose engineers have and are doing important and outstanding work all over the world, we question whether the omission was by oversight or discrimination and, therefore, challenge the writer of the article, the National Society of Professional Engineers, and the editor of the AMERICAN ENGINEER to do justice as it is due.

RAPHAEL G. RIVERSO, P.E.
Scarsdale, N. Y.

► ***Editor's Note:*** **As Reader Riverso points out, many European countries were not included in the article on engineering education. The author, a Rockefeller Public Service Fellow, reported only on countries he visited and apparently limitations of time and money precluded him from making a more extensive trip. Certainly neither the author nor the *American Engineer* meant offense to those nations not studied.**



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"This Month"

This month's lead feature, "Engineering Report from New York City" (an "Engineer at Work" piece), is written by one of engineering professionalism's earliest pioneers. (As a matter of fact, we are proud to say that at one time he was "Business Manager" of this magazine—one of his many NSPE contributions!) We speak, of course, of Frederick H. Zurmuhlen, New York City's Commissioner of Public Works. In "Engineering Report from New York City," Commissioner Zurmuhlen paints a vivid picture of the profession's brilliant contributions toward keeping a city of millions functioning. You'll be even prouder of your title "engineer" once you've read about your profession's work in Gotham.

Practical Professionalism is something for which to strive. What does it mean? It means the realization by both employer and employee that true professionalism means such things as freedom to create, mutual loyalty, profession above self. But it also calls for a practical approach. Such an approach, we think, has been attained in a grand manner by the consulting firm of A. M. Kinney, Inc. Its unique "Time Bank Plan" deserves wide publicity and, indeed, emulation by others. Don't miss it—page 23.

Another "Engineer at Work" feature "This Month" takes us to Northern California and the building of the Trinity Dam. Read how engineers solved knotty technical problems by installing flights of rubber conveyer belting to bring 20-million tons of clay and gravel down a mountainside.

Cal Tech's Dr. Frederick C. Lindvall is with us "This Month" in the article "The 'How-to' of Postgraduate Engineering Education." Dr. Lindvall, a past president of the American Society of Engineering Education, capably reviews the postgraduate subject; a subject growing in importance as the complexity of our technology increases.

Reviewing the news. This month's Consulting section headlines the important Mitchell v. Lublin, McGaughy case which has now been heard by the Supreme Court. Case vital to consultants for, if Government wins, many employees of consulting firms will be determined covered by the Wage-Hour Act which prescribes a minimum hourly wage plus time and one-half for all hours in excess of forty per week. See page 9.

The month in Industry. Westinghouse Air Brake engineers vote against union representation . . . Respondents to an ASME questionnaire (sixty per cent of them) say their companies do not encourage participation in professional activities . . . and the Labor Department says that the demand for engineers is on its way up again.

News under Registration reveals that Pennsylvania's Attorney General has ruled that engineers in the State may practice architecture if "such activity is directly . . . pertinent to . . . their engineering work." Page 15.

And in the back of the book is reported Society News with more on "Project Ambassador" . . . the Society's budget position . . . and the recently completed Board of Directors' meeting in San Francisco.

Kenneth E. Trombley

Editor

Strictly Business

Whitney C. Huntington has joined **Harland Bartholomew and Associates**—City Planners, Civil Engineers, and Landscape Architects, of St. Louis, Mo.—as a consultant. . . . **Clifford L. Fredley** has been named a staff industrial engineer for **Jones & Laughlin Steel Corporation,** Pittsburgh, Pa. . . . **Rudolph F. Besier** has been appointed chief engineer of **Ketchum & Konkel,** Denver, Colo. . . . The consulting engineering firm of **Clark, Daily and Dietz,** Urbana, Ill., have announced the addition of **Dr. W. D. Painter** as a partner. . . . **H. Yale Mageoch,** formerly manager of the Electric Services Works of **Delta-Star Electric Division, H. K. Porter Company, Inc.,** has been named director of engineering and research for the Division, with headquarters in Chicago, Ill. . . . **ALCO Products, Inc.,** Schenectady, N. Y., announces the appointment of **Dr. E. B. Gunyou** as chief of operations for the company's Atomic Energy Engineering Department. . . . The appointment of **William G. Alexander** as assistant general manager of **Stromberg-Carlson,** San Diego, Calif., has been announced. **Stromberg-Carlson,** with headquarters in Rochester, N. Y., is a division of **General Dynamics Corporation.** . . . **Ralph L. Hawks** has been named chief ceramic engineer of the Stain Department at **Vitro Manufacturing Company,** Pittsburgh, Pa.

Mr. Huntington

Bernard L. Friedman has been appointed assistant to the vice president, research and engineering, **Itek, Corporation,** Boston, Mass., it has been announced by **Richard S. Leghorn,** president. . . . **Ray N. French** has been promoted to senior mechanical engineer in the Technical Division at **Humble Oil & Refining Company's** Bayton, Tex., refinery. . . . **Charles E. Wheeler** has been named general manager of **Arizona Testing Laboratories,** with headquarters in Phoenix. . . . The promotion of **George Masurat** to general superintendent for **Philco Corporation's** Government and Industrial Division has been announced. . . . **Col. Robert S. A. Dougherty** (USA, Ret.) has joined the Philadelphia, Pa., management consulting firm of **Mayer and Dibrell and Company, Inc.** . . . **International Resistance Company,** Philadelphia, Pa., announces the appointment of **Jack R. Isken** to chief, reliability and quality engineering. . . . The simultaneous appointments of **Robert W. Morris** as manager of **The Garrett Corporation's** Foreign Operations Department and **Pierre DuFay** as European engineering representative have been announced. . . .

Mr. Wheeler

Thomas M. Dahl has been appointed Midwest region new business representative of **United Engineers & Contractors Inc.,** Philadelphia, Pa.

John W. Scully has been added to the partnership of **Johannessen & Girand,** Architects-Engineers, Phoenix, Ariz. . . . **Dr. Kurt Schlesinger** has been named an engineering consultant in the Cathode Ray Tube Department of the **General Electric Company,** Syracuse, N. Y. . . . **Federal Pacific Electric Company,** Newark, N. J., has announced two new engineering appointments—**Gordon O. Perkins** as manager of the company's Development Engineering Department and **Dr. Andrew A. Halacsy** as a staff development specialist. . . . **Charles E. Beaver** has joined **Buell Engineering Company, Inc.,** in a sales and marketing capacity, according to **Joseph A. McBride,** president. . . . **Henry J. Dumas, Jr.,** has joined **B-I-F Industries, Inc.,** Providence, R. I., as a development engineer. . . . **Intrusion-Prepakt, Inc.,** Cleveland, Ohio, announces the appointment of **Roscoe C. Jennings** as assistant chief engineer. . . . **Jack H. McWilliams,** geological engineer for **Aluminum Company of America,** Pittsburgh, Pa., since 1942, has been appointed manager of ore exploration for the company's Mining Division.

Mr. Perkins

J. P. Lawlor has retired as president of the **General Filter Company,** Ames, Iowa. He is succeeded by **Merlin H. Anderson.** . . . **Harry J. Long** has been advanced to the position of director of manufacturing and purchasing, it has been announced by **Frank N. Getman,** president, **The Wm. S. Merrell Company,** Cincinnati, Ohio. . . . **Ebasco Services Incorporated** has announced the appointments of **H. K. Fairbanks** as consulting civil engineer; **H. W. Stuber** as chief concrete-hydraulic design engineer; **Frederick C. Tonetti** as assistant director of research, and **A. T. Larned** as associate consultant in the Consulting Engineering Division.

Mr. Fairbanks

Expansion . . . **Frederic R. Harris, Inc.,** Consulting Engineers, have recently established an office in The Hague, Netherlands, to serve its clients in Europe and the Middle East. . . . **Palmer and Baker Engineers, Inc.,** have opened a new $600,000 office building in Mobile, Ala. . . . **Bucher & Willis,** Consulting Engineers, have moved their offices in Salina, Kan., to larger quarters at 625 E. Crawford.

Engineers Urged to Accept More Social Responsibilities

An appeal to engineers and scientists to leave their ivory towers and accept more social responsibilities was made at a national conference of the Junior Engineering Technical Society on the Michigan State University campus.

Dr. Christopher E. Barthel, Jr., assistant director of Armour Research Foundation of Illinois Institute of Technology, declared there is a need for engineers and scientists to advance their pestige.

"Their work affects the lives of all people, and they should learn to increase the scope of their activities," he said.

Dr. Barthel told the JETS conference that too many top-notch engineers and scientists have shunned government service, leaving many important positions unfilled or incompetently filled. He called upon the students to share the responsibility for teaching science and engineering to the less fortunate people of the world.

"America is grossly misunderstood and misrepresented abroad," he said. "The tide can be turned by scientists and engineers who can provide technical assistance in lieu of economic aid."

Speaking on "Scientists, Engineers and Tomorrow," Dr. Barthel predicted that expenditures for research and development will surpass the estimate of $20 billion in the next twenty-five years.

Traffic Engineers To Meet in Miami

The 1958 convention of the Institute of Traffic Engineers is scheduled for November 10-13 at Miami Beach, Florida. This is the twenty-eighth annual meeting of the Institute, which is the professional society of highway traffic engineers.

A full program is planned for the meeting, which will include discussions of many current traffic engineering problems. George H. Kunde, traffic engineer of the city of Miami and co-chairman of the local committee, estimates the attendance at over 1,000 persons from all parts of the U. S., Canada, Latin-America, and abroad.

All sessions are scheduled to be held at the Hotel Deauville.

Four technical sessions will feature the program. Planning for these sessions has been in the hands of a committee headed by Edward G. Wetzel, assistant chief of the Planning Division, Port of New York Authority. Among the subjects to be discussed are: "Traffic Operations on Freeways," "Land Use Planning Related to Traffic Generation and Estimation" "Electronics and Traffic Control" and "Traffic Organization in Metropolitan Areas."

Two separate sessions will be devoted to technical committee work.

Official opening of the meeting will take place on Tuesday, November 11, when Joseph E. Havenner, director of engineering and technical services for the Auto Club of Southern California, and president of the Institute, will call the first meeting to order. Following this the keynote address will be delivered by W. F. Babcock, director of the North Carolina State Highway Commission.

AEC Announces Plan For Filming Material

The Atomic Energy Commission has announced a new plan for making engineering and industrial materials, drawings, and literature available for commercial use.

Under the new plan, Cooper-Trent Blueprint & Microfilm Corporation, Arlington, Va.; Rapid Blueprint Company, Los Angeles, Calif., and University Microfilms, Inc., Ann Arbor, Mich., will photograph and distribute engineering materials as they become declassified. The filming will be done on 105mm Micro-Master film negatives. Reproductions in various sizes may be obtained by any interested parties from the three firms previously mentioned.

Keuffel and Esser companies throughout the nation are also serving as distributors for these reproductions. They have catalog listings and price lists of all drawings to date.

The AEC has published a catalog of unclassified engineering drawings and related materials available to the public and to access permit holders in AEC's Civilian Application Program. The drawings are contained in TID-4100, and Supplement No. 1 Engineering Materials List. TID-4100 is available without charge from the Technical Information Service Extension, P.O. Box 62, Oak Ridge, Tenn.

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Tau Beta Pi Holds 53rd Convention in Boston

Tau Beta Pi's fifty-third national convention was held in Boston, Mass., in October. The five Massachusetts chapters, at Worcester Polytechnic Institute, M.I.T., Tufts University, Northeastern University, and the University of Massachusetts, were official hosts. All of the Association's 100 active collegiate chapters were represented at the session. The convention was also attended by Tau Beta Pi's national officers headed by President Harold M. King, retired General Electric Company turbine engineer, of Swampscott, Mass., and President-elect Donald A. Dahlstrom, director of research and development for the Eimco Corporation, Palatine, Ill.

The convention consisted of four business meetings, several specially arranged discussion periods, and a banquet program of particular interest. Plans for the national meeting were made under the general direction of William E. Overstreet, arrangements chairman and M.I.T. graduate student, who had the assistance of the members, officers, and advisors of all five of the Massachusetts chapters. Paul H. Robbins, NSPE's executive director, and Tau Beta Pi's director of fellowships, served as chairman of the convention business meetings.

ASME Featured on Radio

The field of power and mechanical engineering will be featured by Alex Dreier on a nationwide radio program Sunday, November 30, it has been announced by Earl K. Stevens, manager of the National Exposition of Power and Mechanical Engineering.

The program will be broadcast at 6:05 p.m. (EST) over the entire NBC network of nearly 200 stations. Dreier's tribute will tie in with the twenty-third National Power Exposition which begins December 1 at the Coliseum in New York City under the auspices of The American Society of Mechanical Engineers and the concurrent 1958 annual meeting of the Society itself.

The broadcast is called "America on the Go."

Chem Engineers to Meet

Fifteen technical sessions, at which some 100 papers will be presented, are scheduled for the fifty-first annual meeting of the American Institute of Chemical Engineers which will be held Dec. 7-10 at the Netherland Plaza Hotel in Cincinnati, Ohio. Announcement will be made of 1959 officers, and three awards will be presented to leaders in the profession. These will include the William H. Walker Award, the Junior Award and the Professional Progress in Chemical Engineering Award.

In addition to many entertainment features, the delegates also will be offered the opportunity to visit nine nearby industrial installations.

Arguments Given Supreme Court on Wage-Hour Act

• Decision Forthcoming in Near Future

• NSPE Files 'Friend of the Court' Brief

Oral arguments have now been heard by the Supreme Court in the case of *Mitchell v. Lublin, McGaughy & Associates.* Previously, all parties, including NSPE as "friend of the Court," had filed written briefs. It is anticipated that a decision will be forthcoming in the near future, at which time full and complete details will be reported in the AMERICAN ENGINEER.

The question before the Supreme Court for decision is whether employees of professional consulting engineers are covered by provisions of the Wage-Hour Act which prescribe a minimum hourly wage plus time and one-half for all hours in excess of forty worked in any one week. In its "friend of the Court" brief, the National Society contended that the requisites for coverage—an engagement in interstate commerce or in the production of goods for commerce—are not met by a consulting engineer's employees such as draftsmen, fieldmen, stenographers, clerical employees, etc.

The NSPE brief pointed out that there exists a judicially recognized distinction between commercial goods and plans, specifications and drawings prepared by a consulting firm for the particular and exclusive use of clients, which merely constitute a physical reproduction of intangible professional advice and conclusions. They are not produced for sale to the public generally and thus cannot be considered as articles of commerce in the generally accepted meaning of that term, the Society's brief concluded.

Further, employees of consulting engineers are not engaged in interstate commerce, for their various activities do not meet the test of being "actually in or so closely related to the movement of the commerce as to be a part of it." Their duties, the NSPE brief declared, are no different in character from those performed by non-professional employees of lawyers or physicians, who like consulting engineers, are also engaged in the rendition of a professional service.

In essence, the Society's basic premise is that it was not the intent of Congress, in enacting the Wage-Hour Act, to embrace within its coverage firms which render a specialized professional service primarily intellectual, creative, nonstandardized and unique in nature requiring advanced knowledge and training in a professional field.

The question of the applicability of the Wage-Hour Act to consulting engineers has been the subject of conflicting court interpretations for over ten years. It is hoped that the Supreme Court will issue a clear-cut decision completely determinative of the issue, and thereby resolve this vexing problem for engineering and architectural consultants.

Maximum Per Diem Rate Is Increased

The Senate Committee on Appropriations, favorably reporting the Defense Department Appropriation Bill for fiscal year 1959, approved an increase in the maximum per diem rate which may be paid for services of experts and consultants by raising the limitation from the current $50 per day to $60. The act creating the new National Aeronautics and Space Administration signed into law by the President on July 29, 1958, provides that experts and consultants may be compensated at a rate not to exceed $100 per day. This provision was changed from the original $50 per day by House-Senate conferees after NPSE had called their attention to the possible adverse effect such a low limit would have on the agency's ability to obtain top quality consulting services. The $100 per diem authorization has also been repeated in legislation creating the new Federal Aviation Agency.

ICA Issues Amended Policy Directive

An amended policy directive pertaining to the procurement of professional engineering and architectural services by negotiation, has been issued recently by the International Cooperation Administration (ICA). Set aside is the former procedure under which contracts for professional services were based on the selection of a "supplier which can furnish the necessary services at the least cost and with the most satisfactory guarantee (either explicit or implied) of the end product desired."

The new ICA procedure, which is in substantial accord with established NSPE policy concerning the negotiation of engineering contracts, provides, first that any architectural and engineering firms listed in ICA's Uniterm Index will be considered as being interested in contracts with ICA. Then, based on the information contained in the Index, ICA's Office of Industrial Resources will consider the

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qualifications of all listed firms which appear capable of meeting the requirements of the project under consideration, and select at least three which are believed to be the best qualified, listing these firms in order of preference.

Among the factors which will be considered in making the selections are the following:

a. Reputation and standing of the firm and its principal members in performance of the contemplated type of work.

b. Specialized experience in the field of activity for which the services are required.

c. Past record in performing work for ICA, for other Government agencies and private industry, including performance from the standpoint of costs, quality of work, and ability to meet schedules.

d. The volume of work of the firm with ICA in previous years, and the extent to which the firm is currently engaged in other work.

e. Ability to assign an adequate number of qualified key personnel from the firm's own organization, including a competent supervising representative having considerable experience in responsible positions on work of a similar nature.

f. The portions of the work the firm is able to perform with its own forces when required.

g. Ability of the firm to furnish or to obtain required materials and equipment.

h. Financial resources.

i. Familiarity with the locality in which the project is located.

After the selection of firms in order of preference, the Office of Industrial Resources will submit the list to a three-member panel, which will consider the recommendations and information submitted to it and will establish a firm list of companies in order of preference. Unanimous decision of the panel will be final, but should the members disagree, a decision as to a final list will be made by the Deputy Director for Technical Services.

The final agreed list will then be transmitted to the Office of Contract Relations which will negotiate with the first firm on the list in order to obtain a mutually satisfactory contract. At this time the firm will make known to ICA its estimates as to costs and fee. If agreement is not reached, negotiations will be terminated and the firm so notified. Negotiations will then be initiated with the next firm on the list, and so on until an agreement is reached.

According to this new policy directive, any firm which has an engineering or agricultural contract with ICA is normally barred from consideration by ICA for construction contracts on the same project, unless an exception is approved by the Director.

Interested firms whose qualifications are not on file with ICA, or whose filed qualifications are not up to date, should submit the necessary information to Office of Industrial Resources, International Cooperation Administration, Washington 25, D. C.

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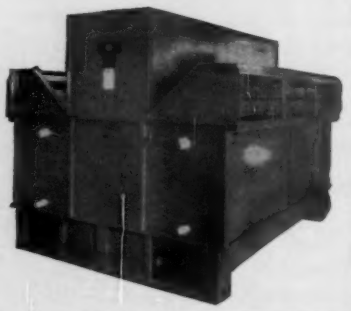

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TVA Revenue Bond Bill Not Passed

Chances for the passage of the highly controversial TVA Revenue Bond Bill were nullified for this past session of Congress when the House Rules Committee refused to approve it for placement on the House action docket. NSPE had strenuously objected, with the cooperation of many consulting engineers, to language in the Bill which would have permitted TVA to perform engineering services for non-TVA and non-Federal interests. Following some last-minute maneuvering, in which the Rules Committee refused to approve the Bill for floor debate and then reversed itself on the following day and agreed to hold brief hearings on the granting of a Rule, Congress adjourned without any final action being taken by the Committee.

Newark College Inaugurates Instructor Training Program

To meet the problem of a scarcity of qualified teachers, especially in a field such as engineering where high industrial salaries lure qualified men from the classrooms, Newark College of Engineering has instituted a program which promises real success in helping to solve the dilemma.

Realizing that too often a man suited to the teaching field is pirated away by the attractive salaries offered recent engineering graduates, NCE has inaugurated its Instructor Training Program which gives the student the opportunity of finding out whether the teaching field is for him before he finishes his formal training.

By observing the ranks of its own students, NCE selects potential faculty members from the senior class. The students singled out are, upon graduation, given free tuition toward earning their Master's degree, the title of Assistant Instructor with the salary of that position and a limited teaching schedule in the day undergraduate division. A senior member of the individual department carefully instructs his new colleague in teaching methods and during the summer months the new recruit is guaranteed employment either in industry or at the college.

Eastman Kodak Co. Announces Fellowships

Eastman Kodak Company has announced the awarding of sixty-one direct grants and thirty-nine fellowships as part of its continuing aid-to-education program, which this year amounts to more than $600,000.

The direct grants, valued at about $295,000, will go to privately supported colleges and universities. The grants are based on the number of graduates of these institutions who joined the company five years ago and are presently employed.

The fellowships, which are for the 1959-60 academic year, are valued at more than $125,000. Twenty fellowships will be awarded to persons studying for the Ph.D. degree in chemistry, six to candidates for the Ph.D. degree in physics, and thirteen to engineering students working for the Master of Science degree.

The company also announced contributions totaling about $200,000 to colleges and universities in areas where Kodak has special manufacturing interests, and also to the National Fund for Medical Education, the United Negro College Fund, the Empire State Foundation of Independent Liberal Arts Colleges, and the Council for Financial Aid to Education.

Faculty Members Attend Institute

One hundred ninety-eight faculty members, representing 108 colleges and universities from forty-two states, the District of Columbia and Puerto Rico, recently completed summer institutes in nuclear technology sponsored by the Atomic Energy Commission and administered by the American Society for Engineering Education.

The purpose of the summer institute program is to provide an opportunity for faculty members to learn the latest reactor techniques and to gain actual experience in dealing with the problems of design, fabrication and operation of nuclear reactors so that they can incorporate this knowledge into the nuclear courses they teach.

The recent summer program included four basic and four advanced-level institutes for engineering school faculty and one basic institute for technical school faculty.

Engineering Science Review Course

The Upper East Tennessee TSPE, in cooperation with the University of Tennessee Extension Division, is currently sponsoring an Engineering Science Review Course directed towards preparing candidates for the basic engineering examination which is semi-annually administered by the State Board of Architectural and Engineering Examiners. There are fifty-seven enrolled in the class from the Tri-Cities, Tennessee area. The course was organized under the guidance of Richard B. Hildage, Upper East Tennessee Chapter Education Committee chairman, with the help of the Training Department of the Tennessee Eastman Company, division of Eastman Kodak Company.

Federal Travel Expense Bill Expected to Aid Recruiting

The final version of the Federal travel expense bill, as signed by the President, permits the payment of travel and moving expenses to first-duty stations only to employees in the natural and mathematical sciences, engineering and architecture, and related technical positions, for which the Civil Service Commission finds a manpower shortage to exist. Families of such employees are also covered. The employee must agree in advance to remain in Government service for a minimum of twelve months, except for reasons beyond his control and acceptable to the agency, or else repay the moving costs. The basic authority is limited to two years. CSC expects the new law to materially aid in recruiting key employees.

Meanwhile, a new recruitment booklet, *Flexibility in the Federal Personnel System*, has been made available to Federal agencies by the Civil Service Commission. Its publication results from a recommendation made by the President's Committee on Scientists and Engineers for Federal Government Programs that the CSC take a leadership role in advising agencies of the flexibilities in recruitment that are possible under the competitive examining system. The booklet is intended for use by key management and operating officials with responsibilities for administering engineering and scientific programs and projects. Copies will be available from the Government Printing Office.

Agencies Given Guide For Awards Plan

A report by the Interdepartmental Committee for Scientific Research and Development on incentive awards suggests thirteen points to guide Federal agencies in applying the Awards Act of 1954, under which an individual may be awarded up to $25,000. The report suggests that the awards plan should be used to stimulate research activity more effectively and that special science awards be established. During the 1957 fiscal year scientists and engineers earned four of the five highest cash awards, and CSC Executive Director Warren B. Irons has advised NSPE that the Commission believes the continued use of incentive awards will enhance the prestige of Federal engineers and scientists and encourage the full use of their talents.

The complete report is available from the Director, Federal Incentive Awards Program, U.S. Civil Service Commission, Washington 25, D. C.

Internal Revenue Issues Publication

Engineer Tax Men, a publication recently released by the Internal Revenue Service, is now available to those interested in this field.

The Revenue Service employs engineer revenue agents in a great many Federal tax cases involving facts and principles which are primarily engineering in nature. This employment field has been expanding rapidly in recent years because of advancing technology, automation, stepped-up mineral and oil exploitation, and the emergence of new industries. These conditions give rise to an increasing number of engineering questions, centering mainly on deductions for depletion of natural resources and depreciation and valuation of properties. This brings engineers squarely into the tax picture along with lawyers and accountants.

Copies of this new publication may be obtained by writing to the Assistant Commissioner (Technical), (Attention T:S:E:), Internal Revenue Service, Washington 25, D. C.

Committee Meets in Milwaukee

Members of NSPE Committee on Engineering Technicians met in September at the Milwaukee School of Engineering, Milwaukee, Wis., to consider items on an agenda to study relations between the National Society and Engineering Technicians in industry and government. Discussing the agenda are, l-r.: J. T. Ludwig, senior development engineer, Gyro Design, Minneapolis Honeywell Regulator Co., Minneapolis, Minn.; Karl O. Werwath, president, Milwaukee School of Engineering; A. C. Friel, Dow Chemical Co., Midland, Mich.; and Merritt E. Williamson, dean, College of Engineering and Architecture, Pennsylvania State University, University Park, Pa. A. B. Newton, director of engineering, York Division of Borg-Warner Corp., York, Pa., is also a member of the Committee.

More Demand for Engineers Says U.S. Labor Department

Demand for engineers has picked up considerably in recent weeks, partly as a result of expanding missile production, according to an analysis by the U.S. Labor Department's Bureau of Employment Security. The estimate is based on reports from local offices of the state employment services, who have been reporting an increasing number of job openings for engineers which could not be filled from the community manpower supply in the areas where needed.

The Bureau said the number of unfilled engineering job openings for which qualified applicants were not available locally rose by 1,400 to 4,335 between July and late September. The September engineering openings were about 400 higher than in September a year ago, but were, however, well below the 6,475 such openings reported for September, 1956.

'Report on Salaries' Released in Canada

A *Report on Salaries* issued by the Canadian Council of Professional Engineers describes salaries paid professional engineers performing duties in seven levels of responsibility as a basis for assessment of individual positions and the determination of their relationship to the responsibility levels in the report. The salary information reported is representative of salaries actually paid in Ontario and Quebec, with monthly medians as of July 1, 1958, for the grades as follows: A, $418; B, $495; C, 575; D, $685; E, $810; F, $1,000; Beyond F, open. The classification guide describes for each level, duties, recommendations, decisions and commitments. supervision received, leadership authority and/or supervision exercised, and minimum qualifications guide. For additional information or copies of the report contact: Association of Professional Engineers of the Province of Ontario, 236 Avenue Road, Toronto, Ontario; or Corporation of Professional Engineers of Quebec, 1600 Pine Ave., West, Montreal 25, Quebec.

Professionals Need Degree Says NLRB

The National Labor Relations Board has again indicated its newly-discovered emphasis on formal college degrees to establish professional status under the Taft-Hartley Act. The Board found "sales correspondents, special machinery," outside the professional definition because "unlike the Servo correspondents, they are not required to have a college engineering degree or its equivalent." (*Kearney & Trecker Corp.*, 121 NLRB No. 107).

RCA Opens Placement Office in New York City

A permanent professional placement office, geared primarily for engineers and scientists of senior level, has been opened by the Radio Corporation of America at 630 Fifth Avenue, New York City, it has been announced by James C. Rankin, RCA manager, General Employment.

Meetings of Note

Institute of Traffic Engineers—Annual Meeting, November 10-13, Hotel Deauville, Miami Beach, Florida.

Society of Naval Architects and Marine Engineers—Annual Meeting, November 12-15, Waldorf Astoria, New York, New York.

American Rocket Society—Annual Meeting, November 17-21, Statler Hotel, New York, New York.

Society of the Plastics Industry—Annual Conference, November 17-21, Morrison Hotel, Chicago, Illinois.

American Standards Association—National Conference, November 18-20, Roosevelt Hotel, New York, New York.

American Society of Mechanical Engineers—Annual Meeting, November 30-December 5, Hotel Statler and Hotel Sheraton-McAlpin, New York, New York.

ASME Survey Shows Failings in Industry

A survey of recent graduates who are associate members of the American Society of Mechanical Engineers discloses serious deficiencies in industry's programs to promote professionalism among engineers, particularly in the small companies. Of the respondents to the ASME Junior Forum, only 40 per cent said their company encourages participation in professional activities. In the large companies, 75 per cent said they were being treated as a professional engineer, but only 33 per cent replied in the affirmative among small companies. As for salary, 80 per cent in the large companies said their compensation is in line with their worth, but only 40 per cent in the small companies were satisfied.

The survey was conducted among engineers who have been employed in industry for two to three years. The group placed in order the following factors which influenced them in the selection of their jobs: type of work, location, salary. In seeking their next job, they said, the factors would be the same except opportunity for advancement replaced location, which fell to fourth place.

Westinghouse Engineers Vote Against Unions

By a ballot count of thirty-six to twelve, professional engineers at Westinghouse Air Brake, Wilmerding, Pa., have voted against any union representation for collective bargaining purposes. The engineers had been represented by the Westinghouse Air Brake Office and Technical Union since 1945, but prior to the vote, the office and technical union withdrew from the ballot, leaving the sole question whether the professionals wanted to be represented by the newly-formed Engineers Professional Association.

Meanwhile, engineers at the Tulsa, Okla., plant of Douglas Aircraft Company selected collective bargaining representation by the

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Southern California Professional Engineering Association, ESA. The California union represents approximately 6,000 engineers and technicians at the company's main plants.

Big Boom to Start For Top Executives

There is a big boom on the way for high-paid ($15,000 and up) scientific-technical executive needs, according to a study of 612 leading industrial corporations. As surveyed by Hoff, Canny, Bowen & Associates, Inc. (Chrysler Bldg., New York 17, N. Y.), an executive placement firm, the boom will probably begin in 1959-60 and be in high gear by 1964-65. The three most important occupational classifications are mechanical engineering, industrial engineering and chemistry. The report further states that over three-fourths of the companies surveyed find it difficult to secure top scientific-technical executive personnel who are equally strong in administrative skills.

Among the more important and interesting findings in the report: Emphasis is on quality, not quantity. Chemistry, electronics and atomic energy offer the greatest financial rewards at present. The Midwest offers the greatest future employment opportunities.

Unusual Clause in New Agreement

An unusual clause in the new four-year collective bargaining agreement between the Sperry Gyroscope Division of Sperry Rand Corporation and the Engineers Association requires the union to conduct an election in the entire bargaining unit (as distinguished from the membership of the union) before it can affiliate with any union representing production or maintenance employees. The union's membership is less than one-half of those it represents. The requirement that a majority of all the affected employees must approve affiliation with a national trade union follows reports the union is flirting with the idea of joining the International Union of Electrical Workers, AFL-CIO.

Architectural Work Defined For P.E.'s in Pennsylvania

Registered professional engineers in Pennsylvania may practice architecture when such activity is directly and immediately pertinent to, or involved in, their engineering work, according to a comprehensive, interpretative opinion by the state's Attorney General relative to the Architects' Registration Law. All told, the opinion answered several specific questions presented in a request by the Superintendent of Public Instruction for interpretation of the architects' statute, so that the State Board of Examiners of Architects could resolve certain problems with which it was faced.

Each of the questions and a summary of the applicable replies are presented below:

Pertinent Work

1. *To What Extent May an Engineer Perform Architectural Work?*—The Pennsylvania Architectural Registration Law provides that a registered professional engineer may do such architectural work "as is incidental to his engineering work." The Attorney General viewed "incidental" as meaning work that is directly and immediately pertinent to or involved in, an individual's engineering practice.

Corporate Practice

2. *May a Corporation Legally Enter Into and Perform Architectural Contracts?*—The Pennsylvania statute expressly prohibits a corporation from qualifying and becoming licensed as an architect. Based on this language and its interpretation by a prior decision of the State Supreme Court to the effect that a corporation cannot hold itself out as an architect or enter into the practice of architecture, the Attorney General ruled that a corporation which enters into or performs a contract which involves the practice of architecture violates the Architects' Law and is subject to criminal penalties. Such a contract is in violation of public policy, and is, accordingly, unlawful and unenforceable.

This opinion does not deal with the corporate practice of engineering which is governed in Pennsylvania by the Professional Engineers Registration Law. That statute provides that corporate practice is unlawful "unless the directing heads and employees of such firm or corporation in responsible charge of its activities * * * are licensed and registered * * * and whose name and seal shall be stamped on all plans, specification plates and reports issued by such firm or corporation."

Architectural Services

3. *May Engineers and Architects, Employees of Corporations, Enter into and Perform Contracts for Architectural Work in Conjunction with Such Corporations?*—Since the answer to question No. 2 declares that a corporation may not perform architectural work, and since a corporation can act only through agents or employees, it naturally follows that no agent, officer or employee of the corporation may enter into such activity on behalf of the corporation. However, corporate officers or employees who are registered architects may perform architectural work which is for the ultimate use of their corporate employer so long as the corporation does not "render or offer to render such architectural services to clients."

Outside private practice by licensed architects employed by corporations is permissible, the Attorney General ruled when he stated: "Corporate officers or employees, who are registered architects, may perform architectural work as a service to clients for themselves, but they must do so as individuals, self-employed, or as principal members of firms, and they must sign and seal all plans and specifications in their individual capacity. They must receive the compensation for this work and they, as individuals, must bear the legal responsibility for this work. Their work must be performed as independent contractors and not as employees."

The Attorney General's opinion viewed the 1957 decision of the Pennsylvania Superior Court in *Baker v. Chambers,* allowing recovery by a corporation on a completed contract for architectural services performed by a registered architect employee, as specifically limited to the circumstances of that particular case in which there was an absence of any express statement by the court that the Architects Law was not violated. However, in the light of that decision, the opinion declared that all contracts with the State or its subdivisions presently being performed by corporations must be fulfilled according to their terms, but that in the future, all contracts should be entered into in conformity with the current opinion.

Must Be Licensed

4. *To What Extent May Engineers and Corporations Advertise on Their Letterheads That They Perform Architectural Services?*—The Pennsylvania statute expressly provides that "no person shall * * * use the title 'architect,' or display or use any words, letters, figures, title, sign, card, advertisement, or other device to indicate that such person practices or offers to practice architecture" unless that person is licensed as an architect. The Attorney General found the above-quoted statement to be so clear as to preclude the need for any extended interpretation or analysis, and merely concluded that corporations or engineers may not, in any way, advertise on their letterheads that they perform architectural services.

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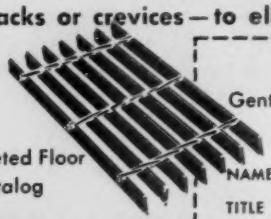

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By

FREDERICK H. ZURMUHLEN, P. E., R. A.

Commissioner, Department of Public Works
City of New York

Engineering Report from New York City

THE evolution of the engineer from a man of war, which was his historical origin, to a man of peace, which is his principal purpose, is marked by lasting monuments to the shelter, comfort and recreation of the people in every community where his professional skill and integrity are retained.

His evolution has been the outgrowth of the social needs of man to live in peace and harmony, health and security with his fellow man, with pride in himself and in his community.

That evolution has brought to the engineer due recognition and respect for his imagination, foresight, ingenuity, precision, compassion and, perhaps above all, his dedication to the welfare of mankind and the progress of his community, of which he is a thoughtful member.

Energized by the heart and mind and by utilizing mathematics, physics and allied sciences, the engineer has contributed more than any other class of professional to our civilization. Out of the chaos wrought by the earliest application of his ingenuity in constructing the engines of war there grew the moral responsibility to rebuild, coupled with the inherent ambition to create.

The principles of moral responsibility and creative ambition are the hallmark of the professional engineer. Without them he would be neither professional nor an engineer.

It is not man's nature to destroy and it is not the engineer's limited lot to aid destruction, rather it is primarily and principally to build and to preserve.

The destructive toll of time and neglect must be repaired as surely as the ravages of war must be rebuilt and so it was that although our shores remained inviolate to attack during World War II, New York City nevertheless found itself in sorry plight at the end of the war.

National, municipal and even individual efforts had been concentrated on our defense measures. Maintenance, repairs and provisions for growth and expansion had been almost entirely neglected in deference to the all-out defense effort.

Thus it became the task of the Department of Public Works, on behalf of itself and on behalf of a dozen other city agencies and departments, to map out a program of new construction as well as extensive rehabilitation and expansion of pre-existing but inadequate or neglected facilities.

Progress on the construction program did not get into full swing until 1948, the year after I was designated to take charge of the Department of Public Works, because of difficulties in bringing projects to the stage where contracts could be awarded.

Chief among the problems which had to be over-

The Department of Public Works' "engineering" equipment includes the sludge vessel "Owls Head." It was launched in 1951.

come was the general limitation on obtaining building materials and essential equipment, plus rapidly rising post-war costs which had completely upset budgeted programs.

Contract awards during 1948, the first full year during which I was in charge of the design, contract award and supervision program for municipal construction, amounted to $35,500,000 and during that same year Capital Budget construction work worth $15,500,000 was completed.

At the start of 1949 the volume of construction work in the Department, including the carryover of contracts let in former years, exceeded $49,000,000.

In the meanwhile, however, in order to strengthen the entire Department for imminent and enlarged post-war programs in design, construction and maintenance, and to improve the efficiency in these operations, the whole Department of Public Works was reorganized, in March of 1948, five months after I became Commissioner.

The design, supervision of construction and the operation and maintenance of bridges and of sewage treatment-pollution control plants were placed under the jurisdictions of two separate divisions designated for those specific purposes and known as the Division of Bridges and the Division of Sewage Disposal.

Looking over the New York Central Building is seen part of the huge metropolis that is New York.

—Photo by Progressive Industries, Inc.

THE design, construction and supervision of major repairs of buildings for the Department of Public Works and for other municipal departments were assigned to the Division of Buildings, together with the supervision of design and construction of new projects.

The housekeeping chores in the operation of public buildings such as Borough Halls, Courthouses, City Hall and Municipal Buildings, was assigned to the Division of Building Management. This is a major function of our Department inasmuch as we are responsible for approximately 8,000,000 square feet of floor space (considerably greater than the area of Radio City) divided among some fifty-six buildings spread throughout the five boroughs which comprise New York City.

Other subdivisions, essential to the smooth functioning of the Department as a whole, are the Divisions of Administration, Motor Vehicles, Engineering Services, Contract Procedure, Shops, and a special group linking the Department with Civil Defense. In the latter is coordinated the emergency engineering resources of sixteen city departments, ten utility companies and about 800 private construction contractors, their potential committed to a centralized defense and rehabilitation program assigned to my Department for supervision in the event of an emergency.

Going back to the war years, maintenance of public buildings necessarily had been of little more than the token variety and construction (municipal) had been at a virtual standstill, but this was not so with design and planning.

Engineers and architects had been assigned under a "blueprint now" program to prepare a backlog of projects intended to be ready for construction when the war ended. The program was intended to anticipate post-war construction which would offset or prevent a serious unemployment problem.

Public Works construction, it was planned, would absorb returning servicemen and others who might be unemployed temporarily during the period of reconversion from national defense to rebuilding, repairing and new construction, to take up the slack until industrial, agricultural and commercial programs could catch up with the mounting availability of qualified help.

Engineers and architects in private practice had been engaged to carry a part of this design load for the principal reason that the ranks of the armed forces had depleted the ranks of Department personnel.

Projects in the design program which had been dependent upon Federal grants or upon subsidies that had failed to materialize had to be eliminated

so that the construction program was reduced to those essential projects which could be carried out with municipal funds.

After this revision it was found that only a small part of the remaining projects of highest priority were complete in all respects, including the required approvals of various city agencies. Efforts were at once directed toward getting these projects ready for construction.

From a naturally slow start, the plans completed during the three-year 1946-1948 period, in terms of estimated construction costs, showed a gratifying annual increase. At the beginning of 1946, completed plans valued at nearly 28 millions were on hand. In 1946 the total was 44⅓ millions; in 1947, 77 millions and in 1948, plans for 162½ millions of new projects were completed. All have long since been fulfilled and form part of the Department's achievement of having passed the half a billion dollar milestone in the value of post-war municipal construction and design during my stewardship.

Probably the most outstanding achievement of the entire post-war construction program was the completion of $200,000,000 worth of work in building and modernizing hospitals in the city's five boroughs.

Mayor Robert F. Wagner said, "The hospital construction program has no match in the world. It is a living demonstration that the people of our great metropolis care deeply for their fellow citizens, for the sick and the indigent. Our people voted a $150,000,000 bond issue to make the program possible. Its achievement is a magnificent chapter in the history of municipal service and one of which all of us can be proud."

Among those of us who can afford to be proud are the engineers and the architects in municipal service who gave so efficiently of their talents as to make fulfillment of this and other municipal improvement programs possible. It would be difficult, indeed, to reduce their worth to words, yet it is wholly inadequate merely to say that without their precision and dedication only a small part of the program could have been fulfilled.

The hospital building and modernization program provided not only 8,000 additional hospital beds for the city's ill and indigent, but X-ray and radiological installations and new laboratories, all incorporating the latest advances in medical science and hospital administration.

Related, though not directly included in the hospital program, was the construction of a number of health centers and welfare centers, each fulfilling a specific need in many of our communities.

BECAUSE of the addition of new beds, obsolescent facilities involving about 2,000 beds were closed in five institutions at a saving of approximately $5,000,000 in annual operation costs.

Coney Island Hospital, Brooklyn, and Elmhurst General Hospital, Queens, were the latest and newest hospital facilities to be completed in the vast post-war program.

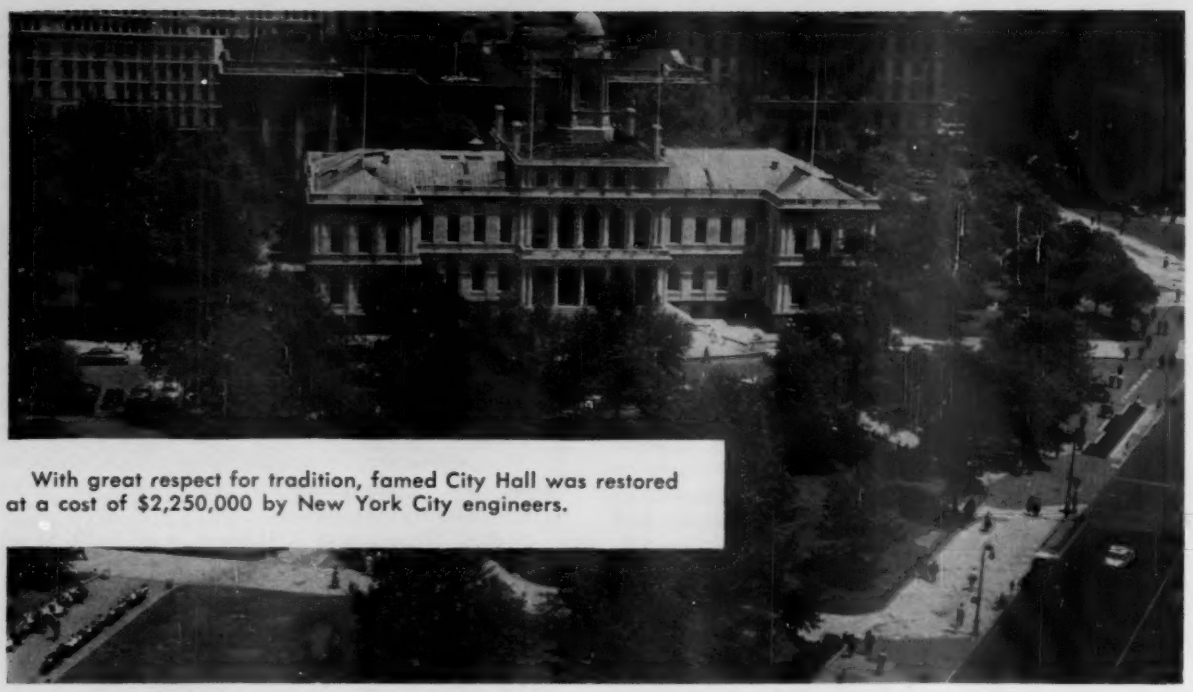
Coney Island Hospital was an $18,000,000 project providing 567 beds and sixty-eight bassinets. Previously existing buildings were converted to the care of the chronically ill, with 300 beds.

Elmhurst General Hospital, including acquisition of the site, construction, furnishings and equipment, represents an investment of $25,210,000 of which $19,742,000 was for construction.

Nurses' Schools and Residences were built as ad-

The 39-story Secretariat Building of the United Nations in New York is a modernistic symbol of progress in the teeming city.

—Photo by Brisk Waterproofing Co.



With great respect for tradition, famed City Hall was restored at a cost of $2,250,000 by New York City engineers.

juncts of Bellevue Hospital, Manhattan, and Queens General Hospital, Queens. The former cost a total of $15,304,000 and provides accommodations for 902 nurses. The latter, including $3,595,000 for construction, cost $4,249,000 and now accommodates 200 nurses.

Other hospitals and related facilities constructed during the past decade include:

Kings County Tuberculosis Hospital, Kings County Laboratory and Morgue Building, and the Cumberland Hospital Outpatient Department Building, all Brooklyn;

Metropolitan Hospital, Bird S. Coler Memorial Hospital, James Ewing Hospital, Francis Delafield Hospital, and Bellevue Hospital New Operating Unit Addition, all in Manhattan;

Department of Hospitals Laundry on Welfare Island; Queens General Hospital Addition, Queens; Sea View Hospital Improvements, Staten Island, and in the Bronx, the East Bronx Municipal Hospital Center and a New Outpatient Department Building at Lincoln Hospital.

The Bronx Municipal Hospital Center is actually a grouping of several units and one of the city's largest projects. It is comprised of the 500-bed Nathan B. Van Etten Hospital, a TB unit finished in 1953; the Abraham Jacobi Hospital, an 898-bed general care unit, the borough mortuary service, and auxiliary buildings for the joint operation of the hospitals. The total cost was $38,545,000.

The tuberculosis unit is a seven-story Y-shaped structure, of contemporary design, with structural steel frame and walls of grey brick. A great expanse of windows admits sunlight and air, and patients have access to cantilevered balconies from their wards. No ward has more than four beds.

There are chapels for Protestant, Catholic, and Jewish services.

A communications system allows nurses to talk to patients without leaving their stations, thus saving steps-per-nurse per day by an estimated forty per cent, a major contribution in this era of nurse shortage. The cost of the TB unit was $15,000,000.

The general care unit is separated from the TB unit by 750 feet. It is composed of two 12-story wings, an interconnecting core of the same height, another wing ten stories in height and an outpatient building six stories in height. The architectural treatment is in harmony with the TB unit.

The Bronx Municipal Hospital Center is considered to be of prime importance because of its close relationship with Yeshiva University Medical College, built on adjoining property.

Another unit eventually will be added to the Center in the form of a Nurses' Residence and School, estimated to cost $7,620,000. With $270,000 in the current Capital Budget for plans, we are in the process of completing the scope and propose to execute an agreement with associated architects and engineers at a fee of about $260,000 for the preparation of complete plans for this facility. Construction of the school and residence is scheduled for 1961-62.

Last year we awarded contracts, including supplemental agreements, amounting to $1,700,000 to private firms of engineers and architects. Part of our purpose was to hasten our design program in order to gain the maximum benefit in an eager construction market. Another purpose was to enable my own staff to more closely supervise shop drawings and assure those standards which it is my determination to maintain while I am entrusted with this phase of the city's construction program.

Among the projects assigned to outside engineering firms is the extension of the Rockaway Pollution

(Continued on Page 41)

FROM WASHINGTON

BY
MILTON F. LUNCH,
N.S.P.E.'s Legislative Counsel

WHEN IS A UNION A UNION?

GERTRUDE Stein made literary history with her: "A rose is a rose is a rose." Which is something unusual by way of definition, even though not very clear or helpful. Defining a "union" would not appear on the surface to pose any great problems, but in some aspects of the question one is tempted to reply: "A union is a union is a union."

The initial question has taken on some rather significant aspects for professional engineers in the light of recent developments, particularly with respect to governmental employees. How should one answer a recent inquiry from a member who had been solicited to join the National Federation of Federal Employees? The member wanted to know, quite properly, whether the organization is a union, a professional group, or a social organization. What about the American Federation of Government Employees, affiliated with the AFL-CIO? It has the same general objectives as the independent NFFE, but is clearly a part of the organized labor movement. Then there are such organizations as the American Federation of Teachers, AFL-CIO; and the American Federation of State, County, and Municipal Employees, AFL-CIO, both operating exclusively in the field of public employment. Many well-known unions include large numbers of public employees in addition to their membership in private employment, such as the International Typographical Union, the International Association of Machinists and the American Federation of Technical Engineers, all AFL-CIO.

The question has taken on much more than academic significance to the professional engineers in the employ of the City of New York. Last month's issue reported in some detail the development of a municipal executive order by Mayor Robert F. Wagner establishing policies and procedures to permit city employees to select a representative for collective bargaining. Mayor Wagner's order speaks of "labor disputes," "terms and conditions of employment," "negotiating and bargaining," and states clearly that it is "the policy of the City of New York to promote the practice and procedures of collective bargaining" for those employees who desire it.

The American Federation of State, County, and Municipal Employees has petitioned to represent the technical employees of the city, including some 500 professional engineers. Is the AFSCME a union? The fact that it is affiliated with the AFL-CIO would indicate an affirmative answer alone, and if there were any question about that answer it would seem to be removed by the recent action of the group favoring the right to strike against public employers.

Assuming that the New York State Society of Professional Engineers is successful in its effort to secure a separate vote for the professional engineers, and assuming that the professionals will vote against representation by the AFL-CIO union, the more difficult questions arise. Suppose a group controlled and operated exclusively by professional engineers, without any affiliation with a labor federation, decides it wants to represent the P.E.'s under Mayor Wagner's order, either because such representation is felt desirable in general, or as an effective countermove to forestall the organizing efforts of a trade union. Assume further that the professionals would intend to operate completely within professional principles—no attempt to strike, no pressure on employees to join, no coercion or improper pressure, etc. Nevertheless, would such a group be a union?

Mayor Robert F. Wagner

The New York City situation is not the only pressing and immediate development pertinent to the question. For some years there has been agitation by the various Federal employee organizations to have formal recognition and some degree of "right" to bargain with the employer-agencies on behalf of their members. Recently there were extensive hearings before a House subcommittee on bills to achieve this purpose. Rep. John Lesinski of Michigan, chairman of the subcommittee, and author of one of the recognition bills said that the intent was to give the employee groups the right to present grievances on behalf of their members, without restraint, coercion, interference, intimidation or reprisal. Disputes resulting from disagreement between the employee organizations and agencies would be referred to an impartial board of arbitration for settlement. Rep. Lesinski was careful to point out that the authority would not permit strikes or any other activities to

the detriment of efficiency or good management practice. Also, it should be noted that the government employee "unions" would not be able to negotiate on wages or hours of employment, which are subject to Congressional decision.

More recently, Rocco C. Siciliano, Special Assistant to the President for Personnel Management, issued a White House directive to the Federal agencies calling for further evaluation of employee-management relations, including relations with employee organizations, in accord with Civil Service Commission policies favoring consultation with employee groups in the formulation of personnel policy, and protecting the right of employees to organize and join (or refrain from joining) lawful organizations representing employees. Siciliano's directive fell far short of that which the

Rep. John Lesinski

Rocco C. Siciliano

Sinclair Weeks

employee organizations would like, but it did give them a new peg from which to press for greater recognition.

Oddly, the agency which has been the most aggressive in recognizing employee organizations has been the Department of Commerce, usually thought of as the voice of business. Secretary of Commerce Sinclair Weeks was the subject of raised eyebrows for permitting his subordinates to issue an original administrative order which allowed the Federal employee groups to collect dues and conduct membership campaigns on government time and property. Drawing even more criticism was that portion of the regulation which openly encouraged Commerce Department employees to join an employee group, as contrasted with the traditional policy of neutrality and equal protection for those who do not desire to join. The repercussions of the Commerce order shortly led to its recall and revision. Now the order recognizes the equal right not to join and rescinds the specific authority to collect dues on government time and property.

Leaders of the employee groups are disappointed at the Commerce turn-about, and may be expected to press more vigorously for Congressional action to enhance their position. On the other hand, there is strong feeling in Congress and out that public employees have no "right" to what is generally called and considered as a union, and that the declaration of union "rights" for public employees is fraught with danger.

In this debate some will recall the events which made Calvin Coolidge a national figure—when as governor of Massachusetts he broke the Boston police strike of 1919 and wrote his oft-quoted sentence to Samuel Gompers: "There is no right to strike against the public safety by anybody, anywhere, anytime." Most unions in the field of public employment disclaim the right to strike, and they cannot, as a rule, negotiate over wages or hours which are fixed by legislation. Yet, there is enough rumbling of a desire by some unions to use the traditional weapons of unionism in the field of public employment to cause grave suspicion.

In this context then, what is a union? The Taft-Hartley Act does not apply, but its definition of a labor organization (union) supplies some guide lines:

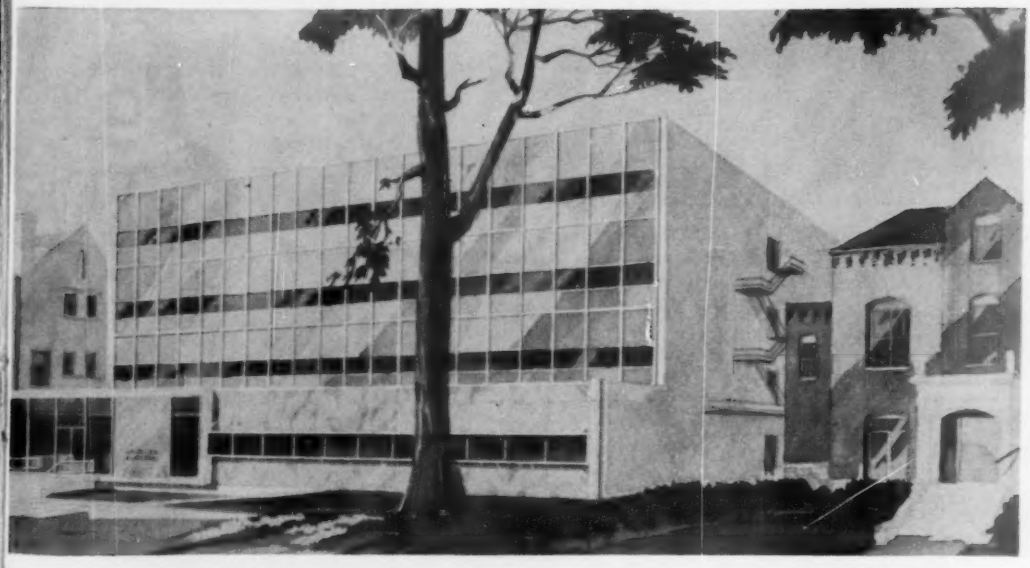
> ". . . any organization of any kind or any agency or employee representation committee or plan, in which employees participate and which exists for the purpose, in whole or in part, of dealing with employers concerning grievances, labor disputes, wages, rates of pay, hours of employment, or conditions of work."

Under this definition, or concept, the type of organizations discussed above, regardless of their being devoid of real power to achieve their objectives, are unions. Except to the extent that the public employer voluntarily is willing to "bargain" the unions can achieve their aims only through persuasion or political influence. This leads some to contend that any organization interested in advancing the economic interests of its members is a union; thus the American Medical Association, the Chamber of Commerce, NSPE, the National Education Association, etc. *ad infinitum*, are "unions." Others will argue that it is only a matter of semantics anyway, that it doesn't really make any difference as long as the organization operates honorably, honestly and ethically. This concept brings the question to its core: A professional organization's primary function is to improve the service and standing of that profession through education and cooperation, thereby indirectly elevating the status of each member of that profession. A union's primary function is to represent its members with respect to their individual status through the use of pressure to the extent possible, arriving at legally enforceable rights of the members. The detailed differences could be noted at great length, such as the vital point that unions must be divisive in that the "bosses" cannot be part of an organization which bargains with the "bosses." A professional organization, of course, does not recognize a "boss" profession and an "employee" profession in the same field.

If the above dissertation does not answer the initial question, perhaps it does suggest some principles to aid those who are or may be faced with the affiliation problem, particularly those in public employment. The complexity and broad scope of the subject defies concrete answers; the writer was accused by a union leader at one time of being unpatriotic for suggesting the undesirability of unions for professional employees because the United States of America was, after all, a union!

At A. M. Kinney, Inc. . . .

Engineers Achieve Job Security Through Unique 'Time Bank Plan'



The new home office building of A. M. Kinney, Inc., is currently nearing completion. Advanced features include fireproof steel frame with curtain walls, central air conditioning, high-intensity fluorescent lighting, and provisions for future expansion. Building at left in picture also houses facilities of the firm.

PSYCHOLOGISTS say that everyone is seeking security. It is only natural, then, that employees expect security in their jobs.

Professional employees of A. M. Kinney, Inc., have achieved a large measure of job security by means of a unique plan which serves to level the peaks and valleys inherent in the work load of the consulting engineering profession.

This Time Bank Plan, as it is called, was conceived and put into operation in 1937 by A. M. Kinney, chairman of the board of A. M. Kinney, Inc. This firm, together with its affiliates employs approximately 300 persons. Integrated professional services are offered in the mechanical, electrical, structural, and civil branches of engineering, as well as architectural services incident to building design. The home office of the firm is in Cincinnati; branch offices are located in Columbus, Ohio, and New York City.

In operation, here is how the twenty-one year old plan works.

Each professional employee of A. M. Kinney, Inc., of whom there are approximately 100, has an account established in the Time Bank. Each overtime hour worked (those in excess of forty per week) is credited to this account at its monetary value of one fortieth of the employee's current weekly salary.

When the work load permits, the employee may take time off for personal affairs against the credit standing in his Time Bank account. If the work load is exceptionally light and the employee's services are not required, the company may request that he take some time off against his credit in the Time Bank or against anticipated future overtime which may accrue to his account. Such time off is debited at its hourly monetary value, again one fortieth of the employee's current weekly salary.

Time Bank accounts are settled each year as of November 30, and the employee is paid for any funds remaining in his account. If, however, there should be a deficit in

One of the many projects completed by A. M. Kinney engineers is the Lambert-Hudnut Manufacturing Laboratories, Inc. This proprietary drugs and cosmetics plant is located in Lititz, Pa.

his account on this date, this deficit is canceled by the company with no penalty to the employee. The ideal situation exists when the employee's account balances on November 30 showing neither credit nor deficit.

If it should be necessary to discharge a professional employee, he is paid any overtime balance remaining in his account. If, however, an employee leaves of his own volition, he forfeits any credit remaining in his account. This forfeiture, it is felt, is in accord with the basic purpose of the Time Bank: to stabilize and maintain continuity of employment. Payments made at various times to persons leaving the company voluntarily would consume the funds of the Time Bank without contributing in any way to the objective of steady employment. Whether an employee leaves voluntarily or involuntarily, however, any balance of time due the company is canceled.

The Time Bank Plan has been successful from its inception in

The Mechanical Engineering Department of A. M. Kinney, Inc., Cincinnati, Ohio, is shown at left. Among the firm's undertakings is the new Cumberland Dam, above, near Pittsburgh, Pa. Currently under construction, the navigation dam was designed for the U. S. Army Engineer District, Pittsburgh, Corps of Engineers.

greatly reducing the normal wide fluctuations in work load and, in so doing, has benefited both the company and its employees. From the company's standpoint, these benefits include:

1. **Greatly reduced labor turnover.** Layoffs during the slack periods have been largely eliminated. Thus the costly period of orientation and familiarization for new engineers and architects has been curtailed.

2. **Improved professional quality of work.** This a direct result of a permanent work force in which employees are thoroughly familiar with their work.

3. **Fewer superivsory problems.** The department heads know their men and know that they know their work.

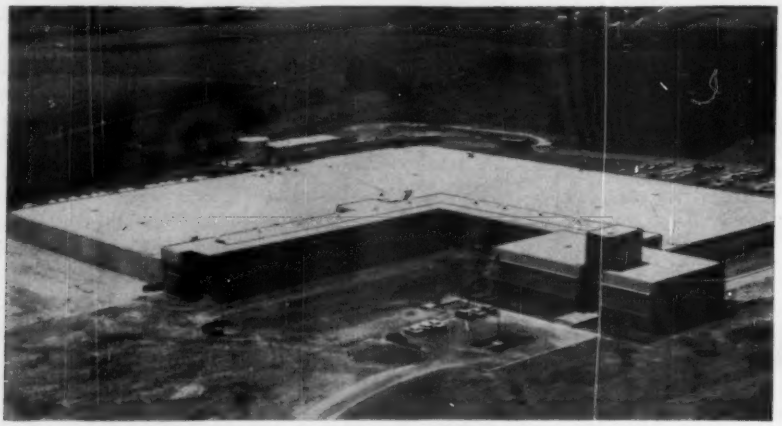
4. **Simpler and less costly personnel administration.** Fewer personnel are hired or laid off. "Help Wanted" advertising is reduced.

The benefits that accrue to the employee covered by the Time Bank Plan are:

1. **Job security.** While not a "guaranteed annual wage," the Time Bank Plan does give the participating employee the knowledge that a layoff during a slack period is very unlikely. He is therefore able to make long-range plans and commitments such as buying a home or an automobile with considerable safety.

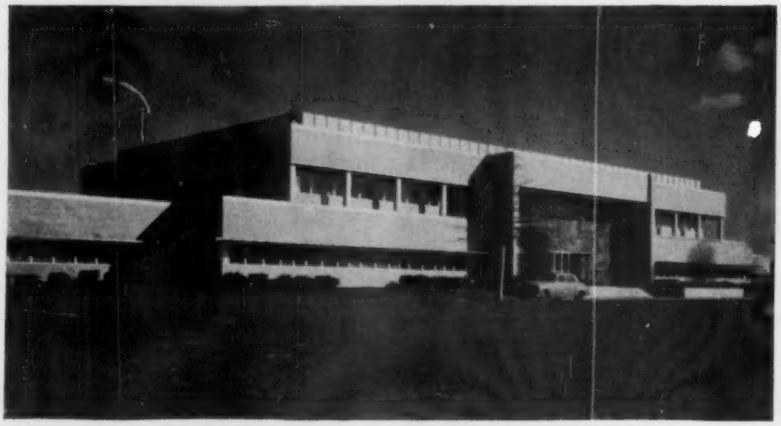
2. **Time off.** The employee is often able to extend his vacation or take an extra day for a weekend trip by drawing on his Time Bank credit.

3. **Extra compensation.** The employee, by not requesting time off, is often able to end the Time Bank year with a sizeable credit in his account, often as much as $400. This amount is paid him in a lump sum together with his annual company bonus just before the Christmas holiday.



Consulting engineers discussed in this article operate under a unique "Time Bank Plan." It has been in effect for twenty-one years and has produced a number of benefits for both the company and its employees. One result of their work is shown above, the Warner-Lambert Company.

The Gibson Art Company in Cincinnati is another effort by A. M. Kinney, Inc., who, together with its affiliates, employs approximately 300 persons.



It should be stressed that the Time Bank Plan operates independently of any other company benefit plan. Time off because of sickness, jury duty, and the like is not deducted from the employee's Time Bank credit. It should also be stressed that the plan is designed solely for professional employees. Below the professional level, employees receive payment for overtime work in the conventional manner at one and one-half times their hourly rate. At the other end of the scale, key employees and executives of the company are paid their salary for the performance of certain specified duties regardless of the hours worked per week.

The worth of the Time Bank Plan is evinced by its twenty-one years of successful operation. The plan has been adopted also by several affiliates of A. M. Kinney, Inc. These firms are the Design Art Corporation, a firm engaged in product design and interior decoration, Processes Research, Inc., an organization offering industrial process planning and research. Dodson, Kinney & Lindblom, consulting engineers, and A. M. Kinney Associates, architects and engineers.—End.

More than 1400 feet of 42-inch-wide conveyor belt shown here on one roll provides belt for the lower end of the conveyor system. Rubber belt will haul twenty million tons of clay and gravel from the top of Pettijohn Mountain to the damsite.

Goodrich Belting Helps Build Huge Earth-Fill Dam

A RECORD-size earth-fill dam, which will harness the Trinity River to develop and expand California's natural resources, is currently being built under the surveillance of B. F. Goodrich Company engineers.

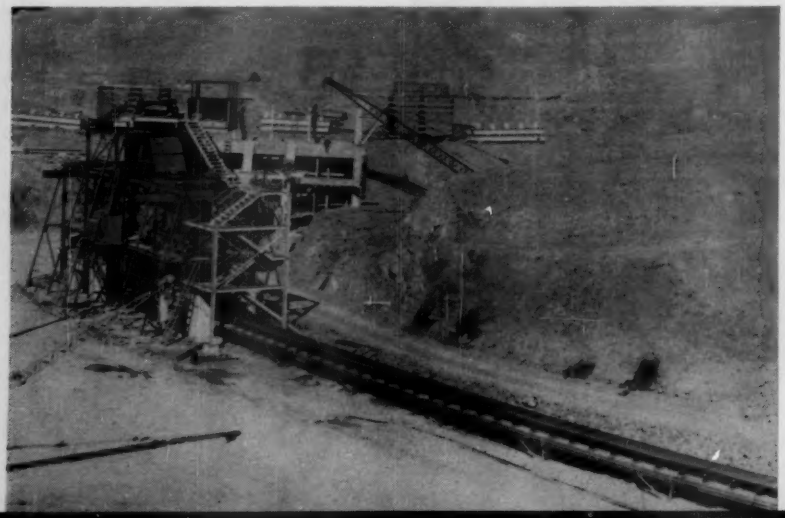
Nine flights of rubber conveyor belting, extending more than two miles down a mountainside, started the three-year task of hauling twenty million tons of selected clay and gravel for the building of this huge dam in Northern California.

The conveyor installation, operating from barrow pit to the damsite, depends on 42-inch-wide belting manufactured by Goodrich. The belting traveling at the rate of 650 feet a minute will carry about 1,400 cubic yards of fill material an hour. Now in full-scale operation, the conveyor system began partial operation in June when the belt splicing and installation were completed by Company field engineers in cooperation with the dam builders. More than 18,000 feet of conveyor belting is involved in the system.

All the belts are vulcanized endlessly on the job. Twenty field splices, varying in length from four feet to 5.5 feet, were completed in an 18-day span. The belts were manufactured in long lengths to minimize the number of splices.

Five flights of the conveyor system (number four through eight) are downhill with an average grade of twenty-five per cent. The total

Conveyor C-1 leads from the pit screening and crushing plant where the rock is sized down to about six inches. A stacker belt and two lengths of 48-inch-wide conveyor belting bring the material from the pit to the screening and crushing plant.



Mountain roller coaster descends 850 feet from peak of Pettijohn Mountain to deliver first of the clay and gravel needed in construction of the Trinity Dam in California.

decline in that area is about 850 feet. The other four flights are over the typical terrain of Pettijohn Mountain which lies northwest of the damsite.

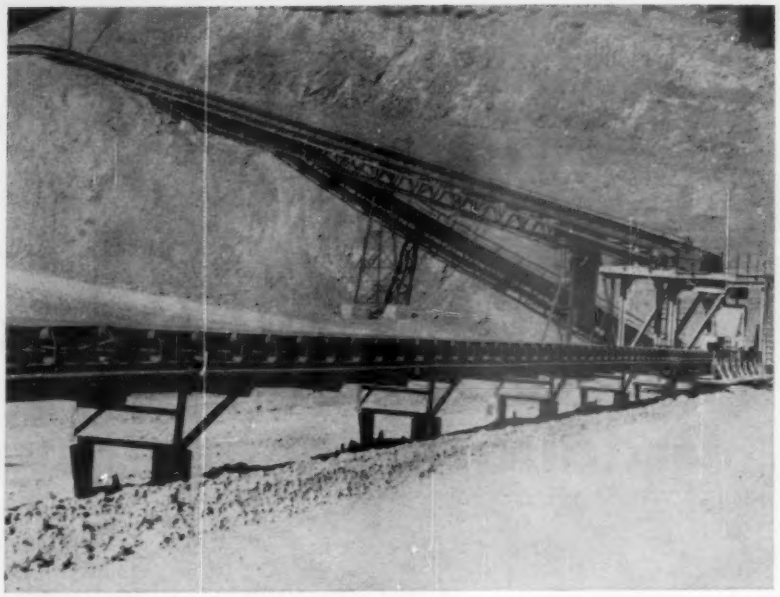
The material being hauled to the bed of the Trinity River channel is principally decomposed andesite. Before it enters the conveyor system the oversize material is reduced to about six inches in a pit screening and crushing plant.

On the main conveyor system, the weight of the declining material makes it possible for the belting to generate electric power which is fed back into the main system. The total power of the entire belt conveyor system is 3,280 horsepower. Of this total, 2,000 HP is within the regenerative systems of flights F4 through F8 and 700 HP total demand power within the flights F1, F2, F3, and F9. The regenerative systems of flights F4 through F8 each have one 300 HP motor and one 100 HP motor directly connected to the high speed shaft of the reduction unit.

Gear-type reduction units, in addition to chain and sprocket reduction, are employed on every unit. The chain and sprocket reduction unit enables belt speed changes to be made economically and quickly. Each of the nine flights has a belt speed of 650 feet a minute. No speed changes have been necessary yet.

The belting is "Longlife Nyfil" high tension construction. Reinforcing members of the belting are rayon-nylon materials. Covers are special compounds of cold rubber.

Safety of personnel working about the belt conveyor system was a major consideration in the design and enginering of the system. Emergency stop buttons are installed along the conveyor's route between each transfer station. Radio communications between the pit station and the terminal station—as well as with belt conveyor patrols—is maintained throughout operating and maintenance periods. Telephones, located at each transfer station, augment radio communication.—**End.**



This view of the transfer between conveyors No. Two and No. Three shows the idlers and the system's structural supports. This project by B. F. Goodrich is being undertaken to develop and expand California's natural resources.

Conveyor belts No. Four through No. Nine are shown here as they carry gravel and clay down the 850-foot decline from Pettijohn Mountain to the Trinity River channel. Conveyor No. Nine in the foreground leads to the damsite. All B. F. Goodrich belting in the nine flights is forty-two inches wide.

During November, Young Engineers' Month, Is a Good Time to Think about . . .

The 'How-to' of Post-Graduate Engineering Education

By

DR. FREDERICK C. LINDVALL, P. E.

Chairman, Division of Civil, Electrical, Mechanical Engineering, and Aeronautics, California Institute of Technology

A YOUNG engineering graduate no longer is expected to be an expert in the particular classical field of engineering which he studied. In a modern engineering curriculum he is not learning current art and practice which might make him immediately useful to an employer on routine analyses and designs. Instead our major industries have taken the long view, that it is the responsibility of industry to continue the education of the young engineering graduate, to teach him today's art of engineering, and integrate him into the specific methods, procedures, and resources of a particular company.

Industry says, further, that the colleges should teach those things which are best taught in an academic institution—the basic sciences, the engineering sciences, advanced methods of analysis and synthesis, and the humanities. These are subjects which a company can teach less effectively than the college unless the company is big enough to set up its own internal college and this is neither appropriate nor desirable except in specialized areas. Internal education programs should have different motivation and objectives from academic instruction and these are things we are discussing in more detail later.

Much thought has gone into the whole process by which the young engineering graduate enters a company and begins his true professional development. Here I wish to direct attention to the effort known as the "First Five Years," which was sponsored first in the Cincinnati area by the Engineers' Council for Professional Development, and later in the Detroit area. Here the effort has been to develop specific programs of company orientation, rotation, educational opportunities in the company and at nearby educational institutions. The plan assists the young men to enter into community activities, church, social, educational and cultural groups. Classes and workshops are conducted in discussion techniques and leadership. In these ECPD experimental programs in Cincinnati and Detroit, industry and educational institutions and community groups have worked hand in hand to make the transition from academic to professional life as pleasant and as rapid as possible. The emphasis has been that professional growth means not merely growth in technological fields, but also in humanistic and social responsibilities which every truly professional man should be prepared to assume. For these latter facets of professionalism, I refer you to the ECPD work.

Postgraduate education in engineering as compared with the basic science is relatively new. Only within the last twenty-five years or so have appreciable numbers of Master's and Doctorate's degrees been granted in engineering. This was partly due to the state of engineering maturity in industry, and to the lack of appreciation of what advanced academic training could do. The aircraft industry, which required analyses at a higher level of sophistication than was general in engineering practice, was the first to give substantial recognition to advanced degrees. In fact the best education in aeronautics has been strictly of graduate character. Now, however, modern technology generally needs many more people with education beyond the Bachelor's level, as well as recognizing the importance of increased scientific and analytical content in the B.S. programs. Some of our larger companies have offered educational opportunities of one kind or another for thirty years or more. Some of this instruction has been in plant; some of it specific, almost corporate indoctrination; some of it has been general—given by some of the companies' best engineers and scientists; some of it has been available at nearby institutions; some of this work has been completely without regard to additional academic degrees; other work has been planned as a degree program. Now educational opportunities have become an im-

portant part of employee benefits and an opportunity to work for an advanced degree on a part-time basis has begun to be an almost essential recruiting "gimmick."

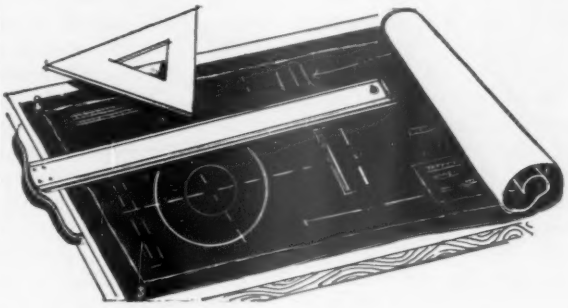
There is a certain amount of competitive and defensive practice among companies with respect to some of these graduate programs, but in general there is a sincere desire on the part of industry to have the young graduates move forward in technical ability through advanced study because of the recognized need in industry today for more advanced abilities than a Bachelor's degree can provide. Throughout the country we find a complete spectrum of plans and educational opportunities, and I would like to review some of these and discuss attributes which in my opinion are both good and bad. Fifty-eight per cent of the present engineering college graduate students are involved in part-time industrial programs, so the problem is not trivial.

As examples of postgraduate opportunities which have been in existence for many years, we can consider three organizations, Bell Telephone Laboratories, Westinghouse Electric Corporation, and the General Electric Company, examining briefly the major features. These show some differences in concept and all show evolutionary changes. This description by no means includes all of the educational opportunities offered by these three companies.

The Bell Laboratories has encouraged course work of two types, the one which was strictly related to company products and needs, given internally by company engineers and scientists, and, the other, subsidized extension or part-time graduate work at nearby institutions. This off-campus work was offered on a basis of tuition refund upon satisfactory completion of the particular course for which the man had registered. This outside work gave opportunity for a student to study advanced mathematics, modern physics, chemistry, and so forth. A student might or might not, through a sequence of courses, meet requirements for a degree at some institution. Later developments within the company expanded the program, with outside courses still encouraged but with more internal instruction available and covering a wider range of technical competence. Most recently the Bell Laboratories have contracted with New York University to operate a Graduate Center, in which New York University faculty offer the courses to company employees as part-time graduate students. The standards for admission, requirements for degrees, and all academic concerns are strictly the responsibility of New York University. In short, the Bell Telephone Laboratories by this arrangement have made it easier for their employees to take a part-time graduate study program in physical facilities at the laboratories provided by the company. Only Bell Laboratories' employees may register with this particular Graduate Center.

WESTINGHOUSE for many years has encouraged its young engineers to register for part-time graduate work commonly in night classes, in colleges and universities near the company's various plant locations. This has developed into quite a comprehensive program with provision for adjustment in working hours, tuition refund, etc., to make this type of technical program valuable and attractive to the young engineers. The essential feature is that the principal educational activity, other than internal orientation courses, has been at established institutions which offer graduate work for all qualified applicants, whether company employed or not. Frequently the schools augment their faculty strength by part-time service of Westinghouse engineers and scientists or from personnel of other convenient companies. Many engineers with Westinghouse have obtained Master's degrees and a substantial number have earned their Doctorates by this part-time outside study procedure.

The General Electric Company until very recently has operated its educational work on a strictly internal basis. A pattern of courses has been developed over



the years to cover the needs of the engineering employees—in all phases of company operation, in specialized subject areas and programmed courses of study, now known as "The Advanced Technical Program." Many of these courses are open to anyone who would take them on his own time. The Advanced Technical Program, with its various ramifications extending through two or three years, is done in part on company time and in large measure in home study. Only a limited group of carefully selected men is admitted to this program which is combined with a rotating job assignment schedule. The instruction is largely by company personnel with occasional outside lecturers. These programs put great emphasis on problem solving. The problems cover many technological subject areas, and frequently one problem involves information and methods from several engineering and science fields. In the second and third years, several areas of specialization are open to the student. A man who finishes three years of this Advanced Technical Program enjoys recognition and prestige within the company of a sort which an advanced degree from an educational institution does not necessarily give.

On the other hand, there is some feeling that for the amount of work which a student has invested in these three years of advanced training, he should have something similar to an advanced academic degree which would be recognized outside the company. The company, however, for obvious reasons, doesn't wish to class itself as an educational institution and grant

(Continued on Page 43)

Board Denounces Engineering Shortage Claims at Meeting

• 'Neutral Attitude' on Unions Hit
• Landis Pessimistic on AIEE Plan

• Dire predictions and rumors concerning the so-called engineering shortage are a disservice to the nation and the engineering profession because they are not based on sound analysis.

• Misguided neutrality on the part of industrial management regarding the unionization of engineers could result in a complete breakdown of the concept of professionalism in industry.

These positions and others taken by the NSPE Board of Directors at the fall meeting in San Francisco late last month represent actions by the group on a broad front.

The Board issued a plea to the nation to stop "adding fuel to the shortage fire." The officials called upon all communications media to "weigh carefully the facts, and soberly analyze those facts, before starting a new wave of publicity to the effect that the nation faces a severe engineering manpower shortage."

The National Society directors urged that all those who intend to speak or publish articles on the subject of engineering manpower first consider the following four points:

1. Engineering school enrollments are at an all-time high and are continuing to increase without artificial stimulation.

2. Action which may force-feed students into engineering curricula without adequate assistance to the overburdened engineering schools can only harm the cause of engineering education.

3. The current engineering need in industry and advanced technology is one based on qualitative, rather than quantitative factors. The serious technological problems facing the nation cannot be resolved by merely adding to the number of engineers.

4. Greater utilization of existing engineering manpower is recognized by all serious students of our manpower problems as a first priority item.

After Board action on a unionization report, Dr. Clark A. Dunn, Society president, said in an interview that the "neutral attitude taken by management in some firms when faced with an election among engineering employees on the question of union representation is actually an abdication of management's responsibility in preserving the distinction between professional and non-professional services."

Dr. Dunn pointed out that "such an abdication of management responsibility has led to a situation in the aircraft and other industries here on the West Coast in which many young engineers have never heard an expression of support concerning professionalism from their employers."

In other significant developments James N. Landis, president of the American Society of Mechanical Engineers, told the Board at a luncheon meeting that the AIEE functional plan for unity was not acceptable to the majority of the presidents of the Founder Societies. Tracing the history of the proposal which would assign technical responsibilties to the Engineers' Joint Council, educational subjects to the Engineers Council for Professional Development, and professional duties to the NSPE, Mr. Landis closed his presentation by reading a recent action by the American Society of Civil Engineers which urged NSPE to join the EJC.

Later, NSPE Past President Garvin H. Dyer, chairman of the Society's Inter-society Relations Committee, asked the Board to approve the following recommendations of his group:

(1) That the NSPE president be authorized to formally invite each of the five Founder Societies

NSPE Board Meets in San Francisco

(through the president of each) to name a member of its board or executive committee as a continuing observer to attend each NSPE Board meeting, at which such observer will have the privilege of the floor. In order to most effectively establish the necessary communication and liaison, such observer should make a comprehensive report back to his board and members of his own society and shall be delegated to attend, if at all possible, all of the NSPE Board meetings during the term of his tenure, which shall be for a period of at least one year. The expenses of such an observer so named and acting in attending NSPE Board meeting shall be paid by NSPE on the same basis as the expenses of national directors.

(2) That the president be authorized to invite the presidents of each of the Founder Societies to designate an individual or individuals to establish liaison with those committees of NSPE in which each such society has an interest.

(3) That there be a mutual exchange of helpful services extended to the respective membership of the NSPE and the five Founder Societies on a basis of mutual agreement between any society and NSPE.

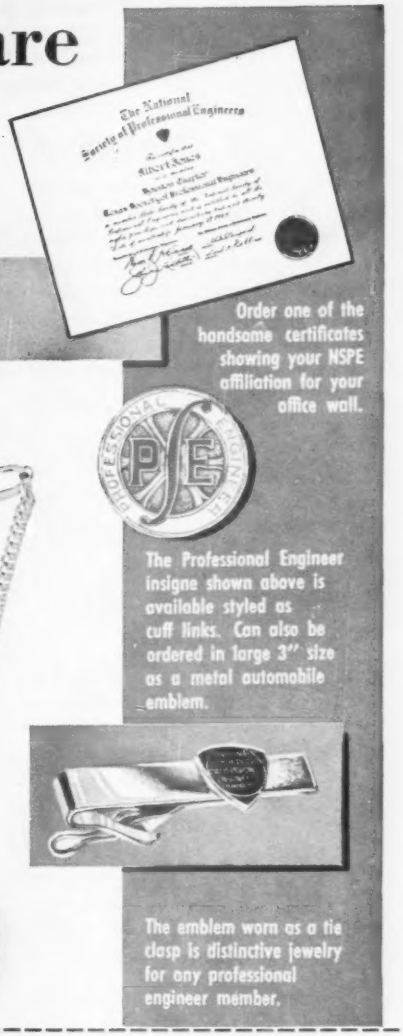
(4) The immediate offering of NSPE services and publications as outlined herein to each of the Founder Societies who approve the Functional Plan, the financing of which is to be on an equitable basis agreeable to both parties.

(5) The publication and distribution of a comprehensive, but condensed, brochure on "Unity and the Organization of the Engineering Profession," this brochure to contain the history, objectives and results of previous efforts toward effecting a full coordination within the profession, setting forth the philosophies of the several efforts and the advisability of effective coordination within the profession, to provide background and information as a basis for discussions of the proposed Functional Plan.

(6) The preparation and distribution of a kit of information to state societies and local chapters as to how they can cooperate in the implementation of the Func-

for Xmas Gifts

certificates and emblems are available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Charms and pins (exclusive of lapel buttons) engraved upon request

Thoughts on Professionalism...

By PAUL H. ROBBINS, P.E.
NSPE Executive Director

The Cost of Professionalism

ONE of the great problems in increasing the professional prestige of engineers and the engineering profession is that there are far too many who fail to see any personal responsibility for the development of engineering as a profession. One of the prominent philosophies of NSPE has been that engineering will gain stature and engineers will have a status only to the degree that individual members of the profession are willing to support professional programs and activities with their time, their energy, *and their dollars.*

NSPE is now faced with some critical decisions caused almost exclusively by the inability of its budget to meet the demands of its members in terms of programs and activities. Last year John D. Coleman, chairman of the Society Income Committee, outlined some of these basic problems and the members have recently been alerted to the general areas of NSPE's concern with the material sent to them in connection with the Voluntary Fund Campaign. It is encouraging to note the instant response on the part of many of the members of NSPE. It is too early, of course, to determine whether or not this response will be of a sufficient magnitude to carry NSPE's programs at their expanding level of activity through 1959.

FORTUNATELY, there has been a great swelling of professional pride within the last decade. The growth of NSPE and the thousands of its members who actively work at professional programs and activities is one of many indications of this growing awareness of professional responsibility. But despite this increased interest and energy, professionalism will not come inexpensively. Perhaps this has been one of the roadblocks in professional development—that attempts in the past have never been adequately financed. Numerous examples can be shown of the success of programs and activities which have had adequate financing. Members of other professions by and large support far more rigorously their professional societies, both in numbers and in finances, than does the engineering profession as a whole.

THE Voluntary Fund Campaign, however, is only an interim step. It is obviously ill-advised for NSPE to expand its activities as contemplated through the availability of the voluntary fund unless these programs can be capitalized and implemented during the succeeding years. Members of the Society are aware, of course, that the Board of Directors has recommended a dues increase to be effective in 1960. This matter will be presented to the membership at the time of balloting early next spring. The dues increase proposed by the Board will be $3 for P.E. members, $2 for E.I.T. members. Yet, reflection on this amount indicates that the yearly cost is much less than our daily newspaper. Each of us can well ask ourselves the vital question: "Is the advancement of our profession as evidenced in the programs of our National Society worth as much to us as professional people as the cost of a subscription to a daily newspaper?"

SOBER reflection needs to be given to the important question: "What price professionalism?"

tional Plan at the local levels.

(7) That liaison between NSPE and EJC and ECPD shall be coordinated at the organizational level rather than at the activity level.

The Board heard progress reports on these additional items:

- The Consulting Engineers' Functional Section appropriated $2,000 to assist in promoting the passage of the Jenkins-Keogh Bill at the next session of Congress. Further, the Section reported that a Compilation of Fees was now nearing completion. In other action the Section reported changes in the liability policy now being made available to members of the NSPE by the Victor O. Schinnerer Company. *(A full story on these changes will appear on the Consulting news page in the December issue—Editor.)*
- The Engineer-in-Industry Subcommittee proposed that once each year the NSPE select an industrial firm which has contributed more than any other toward the advancement and improvement of the engineering profession through its employment practices, and present the firm with an award. The Board approved the recommendation and the first award is scheduled to be made in 1960.
- In a report of the Engineering Scholarship Committee, Chairman Leland S. Hobson asked that all state presidents act now to participate in the Armco-NSPE-Civil Engineering scholarships which are presently available. A memorandum has gone out to the state officials giving the details. Scholarships are available for the 1959-60 school year.
- By action of the Board, Alaskan engineers from the forty-ninth state were accepted as a member State Society of the NSPE.

Society officers and Board members and their wives also took part in a gala social program. Shopping trips, tours of the Bay Area, and luncheons entertained the ladies. Other social activities conducted by the host California SPE included a harbor tour with dinner at Jack London Square in Oakland and a banquet on the following evening.

Bert Hirsch, of the California SPE, acted as chairman of the General Committee for meeting plans.

Members Send Contributions As Fund Campaign Opens

• 'Project Ambassador' Offers Trip

• NSPE President Issues Statement

Contributions from across the country are beginning to pour into National Society headquarters as the result of a mailing piece sent to all members requesting voluntary financial support to maintain 1959 Society programs at present levels.

Greatly increased costs of operations, plus many needed new programs, have strained the Society's financial position to the point where the fund solicitation program was thought desirable as a one-time emergency measure until readjustment of the Society's dues structure is possible.

The "Project Ambassador" portion of the solicitation drive is open to everyone who contributes at least a dollar for every year he has been registered. All those who qualify must submit along with their contribution a resume of experience and background. From these resumes a panel of distinguished judges will select one engineer who, along with his wife, will be sent as a goodwill ambassador to visit professional engineering societies in other countries, as well as outstanding engineering and scientific installations. The professional engineer honored may select the trip in any one of the following areas of the world: England and Western Europe, Central and South America, Southeast Asia and Australia-New Zealand or Canada.

The resume should include positions the engineer held during the past five years; contributions made by the man to industry, the public welfare, the engineering profession, and the community. Further, it should list participation in civic, fraternal and professional organizations.

This assignment as goodwill ambassador is open to all members of NSPE except, for obvious reasons, some elected officers. There are no rigid rules, other than those outlined above, to dictate the type of person that the judges may choose. It may be a young, dynamic engineer who has, in the judges' mind, a fresh and progressive outlook or they may choose an older, widely-experienced engineer because of his maturity. In any case, the engineer selected will enjoy a once-in-a-lifetime trip for two to a distant quarter of the world—first class, all expenses paid—not to mention the great honor of being selected.

In a statement involving the voluntary fund campaign, Clark A. Dunn, NSPE president, has said: "The decision to ask for contributions has been reached after serious consideration, and then only because it will enable us to do the things we should do—now, rather than too late or never!

"Your expanding NSPE is your mechanism for carrying out the programs you want. Your contribution will commit the society to do more things for you and your profession now. Send your check by return mail when the folders from national headquarters arrive in the mail. These folders will tell all about the voluntary solicitation campaign and 'Project Ambassador.' "

A second printed folder requesting every member's participation in the fund drive will be received by all members. It will be the last request and officials urge all members to act promptly as there will be no further notification.

Another unique feature of the campaign is the availability of a personalized desk name plate to all those who contribute $10 or more. The name plate is attractively designed, and the name of the contributor is printed in bold white letters, on a choice of gray, black or walnut background.

Areas Included in 'Project Ambassador'

Here are some typical scenes from areas involved in "Project Ambassador." Top left: A view of Vancouver in Canada; top right: A picturesque home in Devon County, England; lower left: The Hume Reservoir in Australia, and lower right: Copacabana Beach in Rio de Janeiro, Brazil.

Budget Committee Presents Problems to Society Board

By

JOHN D. COLEMAN, P.E.

Chairman, Committee on Society Income

The Budget Committee at the San Francisco meeting presented to those in attendance a most disturbing picture of the limitation of NSPE's programs which may be expected next year on the basis of usual income. Fortunately, our officers and Board of Directors with keen foresight saw the darkening clouds on the horizon and authorized at a previous meeting the Voluntary Fund Campaign to carry us over until the membership can consider the urgent necessity of a dues increase. The response to the initial mailing and opportunity for the members to contribute to the activities of NSPE has been most heartening. As the Budget Committee pointed out, there are three major factors contributing to the financial plight in which the Society finds itself.

One of these factors is, of course, obvious in all operations today; namely, the increase in the cost of doing business. Two items alone have placed nearly a $20,000 price tag on our National Society operations without increasing our activities at all. These are the recent increase in transportation costs and the recently-approved increase in postal rates. To this, of course, must be added the fact that virtually everything the National Society does is costing twenty to fifty per cent more than it did as short a time ago as six years.

A second item occurs because of the increasing size and prestige of the National Society. Numerous examples could be cited of demands upon our Society for representation, staff time and programs requiring expenditure of Society funds never previously appearing in the National Society activities.

The third and probably most compelling factor is the tremendous expansion of NSPE's activities. This is felt as a result of two areas of concern—one, the expanding professional horizons as evidenced by the Society's activities in the area of employment practices, legislation, public relations, and ethics, to mention only a few. The second facet of this problem is that the programs which have been initiated have expanded far out of the proportion of costs originally required to start the programs. Specific examples in this area may be cited in the costs of maintaining our legislative and governmental liaison, our requirements for Engineers' Week, the expanded circulation of the AMERICAN ENGINEER, and the increasing demands upon the Society in the area of employment practices. The development of functional sections, for example, has offered extremely wide vistas of service to elements of the profession having unique and important problems in the over-all professional status of engineering.

Another area requiring immediate attention results from the exploding growth of the Society. For example, in the 1957-58 Administrative Year there were thirty new chapters in NSPE and four new state societies with a fifth one admitted at the October meeting. This brings the total number of state societies to forty-seven and chapters to 373. It is obviously important that the three-level organization of NSPE be well knit, so that the grassroots membership of the Society is familiar with all the national programs and that the National Society be instantly responsive to the composite thinking of its individual members.

In the face of these increasing needs, the Budget Committee was forced to recommend to the Board that 1959 income without the Voluntary Fund Campaign required the elimination of a number of NSPE's current programs and could not provide financing for some of the worthwhile activities requested by the membership and approved by the Board of Directors. Among the items which fell victim to the budget axe were the State Presidents' Conference, the State Secretaries' Conferences, the distribution of the Criteria of Professional Employment to the engineering students, adequate financing of the functional sections, an expanded public relations program, a much-needed, revised and up-to-date Chapter Handbook, the Annual Report, and financing of additional research by the Professional Engineers Conference Board for Industry. If the membership responds to the Voluntary Fund Campaign as it is hoped, there is every confidence that the majority of these items can be reactivated in 1959.

Of course, it is extremely short-sighted for these and other programs to be activated in 1959 if there is no foreseeable financing in '60 and succeeding years to build on the impetus these programs have and will create. Your Society Income Committee has been vitally concerned with this problem, as has your Board of Directors and those of the Society who have studied this problem carefully. The engineering profession and NSPE are faced with challenges and opportunities never before presented to them. It is confidently believed that the members of NSPE overwhelmingly will wish to have the important programs already established and the many new programs on the horizon implemented as rapidly as possible. This, of course, can be done with adequate financing as contemplated by the proposed $3 increase in dues.

Pennsylvania Regional Meeting

Twelve chapters of the Pennsylvania Society combined in a regional meeting with about 200 professional engineers in attendance at Allentown, Pa., in September to discuss "A New Era in Engineer-Management Relations," led by Milton F. Lunch, legislative analyst of NSPE. The meeting was under the sponsorship of the Lehigh Valley Chapter. Carl L. Kreidler, a past president of PSPE and currently a national director, was chairman of the meeting. Shown, l.-r., are: Clarence T. Shoch, past president, NSPE, who introduced Mr. Lunch; Colborn E. Blaisdell, president, Lehigh Valley Chapter, PSPE; Mr. Lunch, and Harold A. Mosher, vice president, Northeastern Area, NSPE.

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REGISTERED ENGINEER, 37, Aggressive, Sales-minded, 10 years experience Mech-Struct Design, Installation, Desires Responsible Position, Prefer Great Lakes —Midwest. $9,000 Minimum. Box 500, AMERICAN ENGINEER.

REGISTERED MECHANICAL ENGINEER, BSME, 34, background of power plant construction and specialized training in central station apparatus. Municipal consulting on waterworks and sewage plants. Have demonstrated promotional ability. Get along well with people. Have done graduate work, taught Heat Power in a leading university. Desire responsible permanent position with consulting firm in Western half of United States. Detailed resume upon request. Box 501, AMERICAN ENGINEER.

GRADUATE ENGINEER 1949, P. E., With diversified experience in industrial and utility power plant work including operation start-up and trouble shooting, and design desires challenging position working with people and equipment. Willing to travel as required. Minimum retainer $10,500 per year. Box 502, AMERICAN ENGINEER.

Army Engineers Chief Speaks to D.C. SPE

"The U.S. Army Corps of Engineers and the engineering profession as a whole have the common goal of raising the professional competence of everyone practicing the engineering arts in America today," said Major General E. C. Itschner, chief of Army Engineers, at the first meeting of the 1958-59 season of the District of Columbia SPE.

About eight-five per cent of regular officers of the Corps of Engineers have college degrees in engineering or related subjects, with about thirty per cent of these having advanced engineering degrees. Practically all civilian engineers employed by the Corps are engineer graduates. The General stated that, although these figures indicate a reasonable adequacy of professional competence in the world's largest engineering organization, the Corps has a real problem in

(Continued on page 40)

Welcomes General Itschner

C. Warren Bogan, left, chairman of the D.C. Board of Registration for P.E.'s, Max H. Morris, president D.C. SPE, and Major General E. C. Itschner, chief of Army Engineers, get together during recent meeting. (See story at left.)

Use these aids for

NATIONAL ENGINEERS' WEEK . . .

HERE ARE the basic promotional aids that will give dramatic impact to your program—the kind of impact that will result in public attention in local newspapers, and on radio and television programs. All these aids have been prepared to show the contributions of engineering to our modern age. Use the handy order coupon below.

1. **One-Minute TV Films:** A set of five one-minute TV films dramatizing the theme of the 1959 National Engineers' Week. Produced under expert supervision to meet network standards, the films call attention to role of the engineer in building for the "age of space." Network TV performers. Each film planned to qualify for public service TV time during station breaks. A set of these five films will give wide coverage to your Engineers' Week program. Price: Set of five films, $25.

2. **"Engineering . . . for the Age of Space:"** A 15-minute tape recorded radio program telling the story of how engineering is bringing about man's new era. Radio network performers dramatize the contributions of the engineer in meeting the challenges that are involved in the exploration of our solar system and beyond. Excellent for use on public service radio time. Price: $6 each.

3. **Lapel Buttons:** A high-quality lapel badge featuring a white design on a blue background. May be distributed to high schools, science clubs, and other groups. Each chapter or state society can set its own price for button sales. Prices: 100 to 500—15¢ each; 500 to 1,000—10¢; 1,000 to 3,000—7¢; 3,000 to 5,000—5¢; and over 5,000—4¢.

4. **Set of Seven TV Slides:** Obtain extensive TV coverage through the Week with these slides displaying poster-type art work and printed copy calling attention to engineering. May be used during all TV station breaks as public service announcements. Price: $10 per set of 7 slides.

5. **Posters:** Colorful 9 x 11-inch pasteboard posters carrying the 1959 Engineers' Week design and theme. This is the basic promotional item for calling attention to the Week. Use on bulletin boards, in window displays, school exhibits, etc. Large size (18 x 22 inches) also available. Prices: 9 x 11, $4 per 100; 18 x 22, $5 per 100.

6. **Paper Banners:** Excellent for display use. Three feet long by 6 inches wide. Has poster design and words "National Engineers' Week" in color. Price: $4 per 100.

7. **National Engineers' Week Seals:** Use these brightly colored seals on all office mail from now through February 28. Poster design printed on 1½-inch gummed paper. Price: $3 per 1,000.

8. **Newspaper Mat Story on Engineers and the Exploration of Our Solar System:** A feature article on the way in which engineering is providing factual answers to questions that only a few years ago were strictly in the realm of speculation. Prepared on mat, with illustration, ready for immediate insertion in daily or weekly newspaper. Price: 50¢ each.

9. **Newspaper Mat Story on What Kind of Educational Background a Graduate Engineer Needs Today:** A feature article on the extent of secondary and college education needed for an engineering degree. Emphasizes the importance of a solid foundation in mathematics and the physical sciences. Prepared on mat, with illustration, ready for immediate insertion in daily or weekly newspaper. Price: 50¢ each.

10. **Logotype:** A metal cut of a poster design to insert in advertising, special sections of newspapers, industrial house organs, magazines, and other printed matter. All state society and chapter publications should have one. Price: $1 each.

11. **"Engineering Builds Broader Horizons:"** A re-issue of the 15-minute tape recorded radio program distributed last year. Just as timely this year. Network performers dramatize the engineering developments behind every phase of the International Geophysical Year. Price: $4 each.

Use this coupon to order your aids now!

National Society of Professional Engineers
2029 K Street, N.W.
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Sirs:

Please rush me items indicated. I enclose a (check.....) (money order.....) in the amount of $..... I understand remittance must accompany order.

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1. .....One-minute TV films @ $25 per set.
2. .....Radio tape "Engineering . . . for the Age of Space" @ $6 each.
3. .....Lapel buttons: 100-500 @ 15c ea.; 500-1,000 @ 10c ea.; 1,000-3,000 @ 7c ea.; 3,000-5,000 @ 5c ea.; over 5,000 @ 4c ea.
4. .....TV slides: set of 7 slides @ $10 per set.
5. .....Posters: regular size @ $4 per 100.
   .....Posters: large size @ $5 per 100.
6. .....Banners @ $4 per 100.
7. .....Seals @ $3 per 1,000.
8. .....Newspaper mat story on engineers and the exploration of our solar system @ 50c ea.
9. .....Newspaper mat story on educational background for engineering @ 50c ea.
10. .....Logotypes @ $1 ea.
11. .....Radio tape "Engineering Builds Broader Horizons" @ $4 ea.

Five TV Films Available for National Engineers' Week

Five one-minute TV films calling attention to the theme "Engineering . . . for the Age of Space" will be available to all NSPE groups for the 1959 National Engineers' Week.

Produced for the National Society in Washington, D. C., the films are designed to point out the role played by engineering in bringing about the new era which America and other nations are now entering—the era of the exploration of the space outside the atmosphere of our planet.

The five films include scenes showing the satellite computing center in Washington, D.C., rocket firings at Cape Canaveral, the world's largest radio telescope, atomic reactor experiments, and finishing work on a satellite. Narration behind the films is done by experienced network announcers.

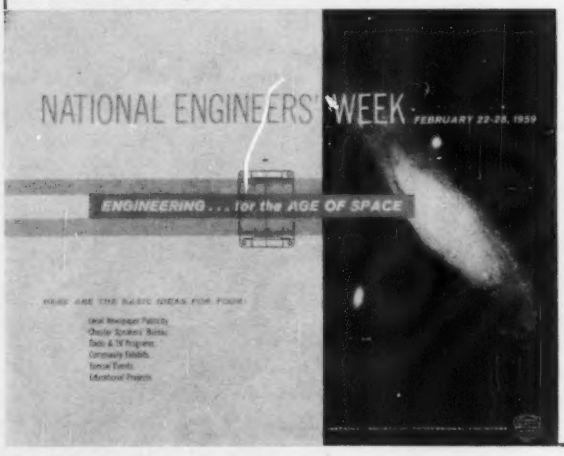
The films are available in sets of five 16mm prints from the National Society at a cost of $25 per set. All films will qualify for public service time during TV station breaks. The films should be ordered as soon as possible to allow time for advance screening by local television station program directors.

The National Society is making arrangements to have the films used on five major network programs during the week of February 22-28. The sponsors of these programs represent the chemical, electric, steel, aluminum, and atomic industries. Prints of the films in 35mm will be made available to the sponsors of these programs. The use of the films on these network programs should result in an audience of well over fifty million TV viewers for the National Engineers' Week promotion.

A 29-minute color film entitled "Mackinac Bridge Diary" is also available for the 1959 Engineers' Week. Prints of the 16mm film are being made available to all interested NSPE groups through special arrangements with the United States Steel Corporation. The film covers the step-by-step construction of the newly completed Mackinac Bridge across the Straits of Mackinac leading to the upper peninsula in Michigan. It is cleared for television and may be used on any local station.

Reservations for the film must be made by January 9, 1959. Return address cards for the reservations and a pamphlet describing the film are included in the Engineers' Week promotional kits. Requests for reservations should be sent to United States Steel, Pittsburgh Film Distribution Center, 525 William Penn Place, Pittsburgh 30, Pa.

National Engineers' Week Kits



National Engineers' Week promotional kits carrying this cover design have been sent to all NSPE affiliates.

By Mrs. Garvin H. Dyer, Chairman of the Ladies Auxiliary Advisory Committee.

Enthusiastic reports are coming in from every section of the country as auxiliary activities are opened for the 1958-59 year. Increased interest is evidenced by many new members being reported, and attendance is excellent. And interest in forming new auxiliaries is increasing steadily.

Mrs. H. Douglas Fox reports that the Weirton, W. Va., Auxiliary held its first meeting in September with two engineers from India who are in this country to study the manufacture of steel, as guest speakers. After a buffet luncheon consisting of Indian food, Dave Frew, co-ordinator of the India Engineers Training Program, introduced the engineers who spoke on their native land and answered questions on social customs, political views and impressions of this country.

Other auxiliaries having engineers as guest speakers were the Smoky Valley Chapter of Kansas with Professor Leland S. Hobson, associate director of Engineering Experiment, Kansas State College, who spoke on education problems facing engineers. The Western Chapter Auxiliary of Missouri had Past President Garvin H. Dyer as guest speaker for their luncheon meeting, September 9. Mrs. Dwight Busby reports that the Central Arizona Chapter Auxiliary opened its fall season with a pot-luck supper.

Reports come from Houston, Texas, of big plans for the TSPE convention, January 22-24, under direction of Mrs. R. M. Keiller. Highlight will be a luncheon at River Oaks Country Club, tea and

(Continued on page 40)

Discussing Plans

T. M. Keiller, chairman of the Steering Committee for the Texas SPE's annual meeting, January 22-24, discusses preliminary plans with R. Frank Nowlin, president of the host San Jacinto Chapter, and Charles A. Lawler, the Chapter's co-chairman for the meeting.

Annual Texas Meeting Slated January 22-24

Plans are under way to make the 1959 Texas SPE convention, at the Shamrock Hilton Hotel in Houston, the largest in the history of the State Society. J. L. Rike, chairman of the convention's Publicity and Attendance Committee, says "We are expecting at least 500 delegates and wives to attend the convention in Houston. This figure is well above the previous record of the 1957 convention in San Antonio." Host for the convention is the San Jacinto Chapter which boasts the largest membership in the State. T. M. Keiller, past president of the local Chapter, is chairman of the 1959 convention Steering Committee which has made preliminary hotel arrangements with the Shamrock Hilton.

The several convention committee chairmen all report excellent cooperation from both the Society members and outside organizations in Houston. R. Frank Nowlin, president of the San Jacinto Chapter, recently received a telegram from Mayor Lewis Cutrer welcoming the 1959 convention to Houston.

NSPE officers expected to attend are Clark A. Dunn, president, from Stillwater, Oklahoma, and Noah E. Hull, area vice president from Houston.

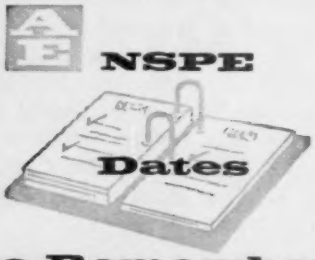
H. A. Mosher Speaks at Connecticut Meeting

The Hartford County Chapter of the Connecticut Society of Professional Engineers at a recent dinner meeting had as their guests the newly registered engineers and EIT's in the area. Chapter President Virgil Maguire introduced each new registrant to the seventy-one members present.

"What the NSPE Has to Offer the Engineer" was the theme of remarks by NSPE Vice President Harold A. Mosher, NSPE Director Ted Braaten, and CSPE President Ernie Mortenson. This tribute to new engineers has become an annual custom with the Chapter.

Lewis S. Finch Given Award By Indiana SPE

Lewis S. Finch has been selected by the Indiana SPE as "Engineer of the Year in Indiana" for outstanding public service as well as work within the profession. He has served as president of the Indiana Engineering Council and as president of the Indiana Engineering Society, a predecessor organization to the Indiana SPE.



to Remember

Professional Engineers of North Carolina—Annual Meeting, January 8-10, 1959, Barringer Hotel, Charlotte, North Carolina.

Louisiana Engineering Society—Annual Meeting, January 15-16, 1959, St. Charles Hotel, New Orleans, Louisiana.

Mississippi Society of Professional Engineers—Annual Meeting, January 16-17, 1959, King Edward Hotel, Jackson, Mississippi.

Texas Society of Professional Engineers—Annual Meeting, January 22-24, 1959, Shamrock Hilton Hotel, Houston, Texas.

Oklahoma Society of Professional Engineers—Annual Meeting, January 30-31, 1959, Mayo Hotel, Tulsa, Oklahoma.

National Society of Professional Engineers—Winter Meeting, February 19-21, 1959, Dinkler-Tutwiler Hotel, Birmingham, Alabama.

National Society of Professional Engineers—Annual Meeting, June 17-20, 1959, Commodore Hotel, New York, New York.

This Month's Authors . . .

Mr. Zurmuhlen

Frederick H. Zurmuhlen is beginning his twelfth year as administrative head of the Department of Public Works in New York City, having been appointed by former Mayor William F. O'Dwyer, reappointed by former Mayor Vincent R. Impellitteri, and twice reappointed by Mayor Robert F. Wagner. Commissioner Zurmuhlen received his Bachelor of Science degree in civil engineering from Manhattan College in 1925.

A past president of the New York State SPE and a past vice president of the National Society, he also served at one time as business representative of the AMERICAN ENGINEER.

He is a member of the American Society of Civil Engineers and a number of other professional organizations.

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Mr. Lindvall

Frederick C. Lindvall is chairman of the Division of Civil, Electrical, Mechanical Engineering and Aeronautics at California Institute of Technology—a position he has held since 1915. He received a Bachelor of Science degree in electrical engineering from the University of Illinois in 1921, and his Ph.D. degree from California Institute of Technology in 1928.

Mr. Lindvall also serves on the board of directors of several firms, including Preco, Inc., Los Angeles; Consolidated Electrodynamics Corporation, Pasadena; Electron Motors, Anaheim, and Stanford Research Institute.

He is a Fellow of AIEE, a member of ASME, ASEE, AAAS, and other organizations.

New Literature

SPEED REDUCER—Link-Belt Company has issued a 24-page book describing its completely new line of shaft-mounted speed reducers. "Shaft-Mounted Speed Reducers," Book 2618, contains engineering and selection in-

formation on: single reduction drives in six sizes, with nominal ratios of 5-to-1 and capacities up to fifty horsepower; and double reduction drives in seven sizes, with nominal ratios of 15-to-1 and up to forty horsepower.

(Circle 15 on Readers' Service Card)

POWER TOOLS—A newly-revised 88-page catalog, describing a complete line of industrial power tools and accessories, has been issued by Rockwell Manufacturing Company's Delta Power Pool Division. Some of the industrial tools described are Delta's line of drill presses, grinders, shapers, planers, jointers, metal and wood cutting lathes, tilting arbor saws, unisaws, band saws and radial saws. Complete specifications, catalog listings and descriptions of accessories for all tools are included in the bright, two-color catalog. Action photos and drawing supplement the text. Chain feed control and safety return for the Delta 16"-20" radial saw, top a list of new accessories designed to broaden the production-line applications of Delta tools. Other new accessories described include the Slow-Stare for 12" variable-speed wood lathers, new heavy duty lamp attachments. Slo-Speed for 20" drill presses and the filler block for gap bed wood lathes.

(Circle 16 on Readers' Service Card)

CHEMICAL MILLING—Seventh in a continuing series, a new design bulletin describes the first breakthrough in chemical milling of cast parts. Issued by United States Chemical Milling Corporation to assist design and production engineers as well as foundrymen in removing selected areas of metal from cast parts, or reducing the over-all weight of castings, Design Bulletin No. 7 is the first piece of technical literature available describing advances recently made in the state of the art of chemically milling castings. The new developments, pioneered by USCM and described in the published data, deal with the various techniques perfected that are in use today to actually improve, in many cases, the surface finish of cast parts through chemical milling. The literature includes such information as tolerances attainable, suitability, over-all and controlled area reduction, and surface finishes that can be consistantly expected when casting such metals as aluminum, magnesium, magthorim, steel, and other cast alloys. Previous Design Bulletins have dealt with quality control, materials for chemical milling, tooling for chemical milling, blueprints for parts to be chemically milled, and chemically milled integral stiffeners.

(Circle 17 on Readers' Service Card)

ELECTRONICS CATALOG—Allied Radio Corporation, distributors of radio and electronic parts and equipment, announces the release of their 1959 general catalog. The 452-page catalog (208 pages in rotogravure and 4-color covers), lists over 32,000 items. Special emphasis has been placed on equipment for industrial maintenance, research and production requirements. These are detailed listings of standard and special-purpose electronic tubes, transistors, semi-conductors and diodes, test instruments, voltage stabilizers, transformers, resistors, capacitors, printed circuit components, rheostats, relays, switches, rectifiers, fuses, tools, wire, cable, photo-electric components, 2-way radio-telephones, sound powered telephones, power supplies and a wide variety of other electronic equipment and components.

(Circle 18 on Readers' Service Card)

BALLAST MANUAL—A manual on Fluorescent Lamp Ballasts, which completely illustrates and explains all about ballast circuits and construction, has been released. Ballast Manual

fully describes all phases of ballast manufacture, installation and operation. It shows how to test ballasts and measure current, illustrates in detail a new easy-to-use ballast quiet rating chart.

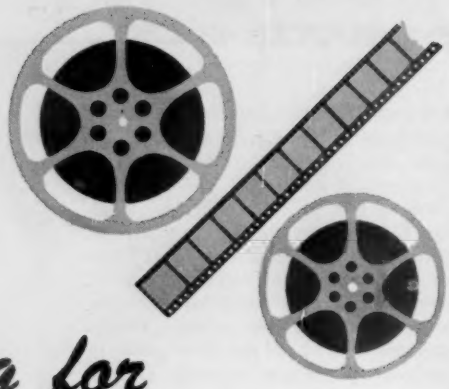
(Circle 19 on Readers' Service Card)

CONDUIT—"Aluminum rigid conduit can now be purchased and installed at a cost comparable to, or less than, that of conventional conduit." This is the opening statement and theme of "Alcoa Aluminum Electrical Rigid Conduit," latest publication for the electrical industry by Aluminum Company of America. The new booklet outlines briefly the mechanical and electrical advantages of aluminum rigid conduit. It states that these properties are of sufficient importance in many applications to have warranted the paying of a premium for aluminum conduit in earlier applications. With the changed price relationship of aluminum and steel, the booklet points out, these advantages may now generally be enjoyed at equivalent cost for installed conduit. Often, a net saving may result. Although primarily a descriptive brochure, the new Alcoa booklet gives specific installation instructions and a comprehensive table of dimensions and weights of conduit, couplings, and elbows.

(Circle 20 on Readers' Service Card)

These listings are informational only and are not an endorsement of the products, nor of the manufacturer's claims. To receive any of the new literature described in this column, merely circle the item number on the Readers' Service Card and mail to AMERICAN ENGINEER.

NSPE Presents:



"Building for Professional Growth"

Here is a film covering the activities of the National Society of Professional Engineers at the chapter, state, and national levels. A milestone in the NSPE public relations program, "Building for Professional Growth" is a filmed presentation on the values and benefits of Society membership. Activities covered in the film include NSPE efforts in registration; research projects such as the Income and Salary Survey, the Professional Engineers Conference Board for Industry reports; legislative cooperation; National Engineers' Week, and other programs. Also included are scenes from actual chapter, state, and national level meetings.

"Building for Professional Growth" can be shown on any 16mm sound projector. Reservation requests should be made for three choices of dates. Notification of available date will be sent from NSPE headquarters immediately after each reservation request is received.

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ARMY

(Continued from page 35)

raising the professional qualifications of its reserve officers who outnumber the regulars two to one.

With less than fifty per cent of reserve engineer officers having engineering or related degrees, a continuous effort is made to enroll these officers in both residential and correspondence courses in the Engineers School at Fort Belvoir, Va., with constant encouragement being given to these officers to follow through to seek registration as professional engineers in their home states or states of residence.

Max H. Morris, recently elected president of the D.C. Society, also introduced C. Warren Bogan, chairman, Board of Registration for Professional Engineers in the District of Columbia. Mr. Bogan spoke briefly about progress that has been made all along the eastern seaboard from Virginia to Portland, Me., in developing a uniform examination, which, he said, will tend to establish uniform standards for qualifications for registration.

AUXILIARIES

(Continued from page 37)

style show, and a luncheon at the Houston Engineering and Scientific Society.

Mrs. Alexander Shashaty, publicity chairman for the Mahoning Valley Auxiliary (Ohio) writes that they had a casserole supper which was also attended by the husbands and prospective members. The program consisted of Congresswoman Frances Payne Bolton's filmed report to Congress, "African Giant." The Columbia Chapter Auxiliary of South Carolina held a family style picnic on September 6, with swimming, fishing and dancing to provide a wide range of activities. The Midwestern Chapter of Pennsylvania opened the season with a dinner meeting. Mrs. Charles Thompson spoke on "The Art of Drying and Arranging Flowers and Foliage." Members of the Cleveland, Ohio, Auxiliary acted as hostesses at the recent dedication of the beautiful new building for engineers, the Engineering and Scientific Center.

ZURMUHLEN

(Continued from Page 20)

Control Plant which serves a recreation area of world renown.

Extension of the city's rapid transit system to that area created an expansion boom with which we intend to keep pace, hence a contract for $125,000 was awarded to provide us with plans upon which we can proceed to double the capacity of the sewage treatment plant.

Another project on which time is considered to be of the essence is a mid-town municipal parking garage. We let a $53,000 design contract last year and expect that construction will start before the end of this year. Estimated to cost a million and a half dollars, the garage will accommodate 470 cars in one of the city's busiest, most traffic-congested areas.

The largest award last year was half a million dollars for plans and specifications for a Department of Sanitation Central Repair Shop and Garage which will be built in Queens County at an estimated $13,000,000. This will be part of the $80-million program of expansion and rehabilitation of incinerators and other facilities over which my Department will have supervision until they are ready for actual operation and maintenance, at which time they will be turned over to the Department of Sanitation.

One of the more widely publicized projects for which a study contract was granted last year is the survey which proposes a 30-story replacement for Bellevue Hospital.

The need for reconstruction, rehabilitation or replacement of units comprising the present hospital, most of which were built during the period of from thirty to fifty years ago, is predicated upon the overwhelming opinion that existing facilities are antiquated.

It is thought that the proposed new unit could replace most, but not all, of the present structures and that it can be built and equipped for about $85,000,000. The study suggests that the new Bellevue could be built in phases financed through the Board of Estimate over a period of five years, partial amounts to be allocated each year.

It would provide 2,300 beds, or about 600 more beds than the present over-taxed and spread-out facilities provide.

THE survey was produced at a cost of $85,000 and at this writing it is being considered for official approval. If the study is accepted there is $1,000,000 in the Capital Budget to guarantee complete plans and supervision of the execution of those plans.

Those forces and principles which are the hallmark of the engineer made it possible for us to complete the first phase of another ambitious program last year, the substantial reduction of pollution in Class A waters contiguous to New York City. That first phase of the pollution control program represents a post-war investment of $125,000,000 in the most modern sewage treatment and disposal plants, including their interceptor systems.

We have already embarked on the second phase which is designed to control pollution of the harbor. This phase is likely to cost close to $300,000,000 before we can claim to have substantially stemmed the tide of pollution.

It is a challenging problem and again we would be at the mercy of relentless forces if it were not for the advances made in research by the method of trial and error, trial and success. The application of successful methods devised and developed by professional engineers and directed toward solution of this age-old issue will, we believe, see us through. We think we have the solution, but only time will tell.

The problem of sewage disposal has plagued civilization for some 300 years but in the world's most modern city it was not attacked on a carefully organized basis before thirty years ago. The Department of Sanitation was established in 1930 to succeed the Department of Street Cleaning and the thought of a city-wide solution of the pollution problem was accepted.

Only then was it envisaged that the city's entire sewage waste should be treated in order to protect bathing beaches, possibly rehabilitate shell-fish bed areas, safeguard health in general and reclaim shorefront properties for recreational, residential or industrial development.

Elementary and virtually ineffective methods had been employed earlier, offering token treatment with fine screens and grit chambers. Engineers and chemists had long decried these simple methods and warned that with the spread and growth of population the oxygen demand on peripheral waters soon would become a threatening factor. It was insisted that modern methods, no matter what the cost, must be employed.

Meanwhile, the depression of the 30's had set in and a new factor, the combined storm-sanitary sewer was added to the problem.

This was an assessment-saving device intended as a temporary relief measure for outlying and expanding communities of Brooklyn, Queens and the Bronx, populated by wage-earners of limited means who were even being subjected to salary cuts in those depression days. The formula, however, could not be shaken thereafter and up to the present time we are confronted with the clamor for combined sewers as a continuing assessment-saving measure.

For all practical purposes, it is not for me to say what should be done with the existing combined sewers, which at times tax our treatment plants, but I am firm in my insistence that we cannot hope to cope with the pollution control problem unless still-to-be-developed areas of the city, notably in Queens, the Bronx and Staten Island, are equipped with separate sewers.

Referring back to the plans evolved in the early 30's, suffice it to say that a general scheme or plan provided for the eventual treatment of industrial and domestic liquid wastes throughout the city and when the new City Charter was adopted in 1938 the entire program was transferred to the jurisdiction of the Department of Public Works.

As subsequently revised, the plan now provides for the operation of eighteen modern treatment plants with a combined and ultimate (1970) capacity of 1689

MGD. New York City, which is committed to this gigantic pollution control program under a modified Consent Order of the Interstate Sanitation Commission, now produces over one billion gallons of domestic and industrial liquid waste daily, an average of 130 gallons per capita.

The city's twelve modern plants now treat an average of 715 MGD, at a cost of $27.46 per million gallons. The cost of operation and maintenance of these plants was $7,184,000 for 1957, of which $4,650,000 represents salaries and wages; $77,000 for gas, $853,000 for power, $154,000 for chlorine and copperas, and $1,450,000 for repairs, supplies and materials.

NOTABLE is the fact that in addition to the mechanical equipment required for the treatment processes eight of the treatment plants are provided with power generating facilities. By the end of 1957 a total of thirty-seven engines were serving as sources of power, of which fifteen use gas and twenty-two are of dual-fuel type. The combined capacity rating of all thirty-seven engines is 35,400 horsepower.

The average performance of all the engines over a four year period shows that approximately eighty-five per cent of the engine fuel demands have been supplied by gas resulting from the digestion of sludge, four per cent by purchased natural gas and eleven per cent by purchased diesel oil. The eight individual power stations generated an equivalent of 58,100,000 KWH per year during the four years, thereby effecting enormous savings in the purchase of fuel and power.

Not only have the engines provided the necessary power for plant requirements but also a large amount of energy was recovered from the operation in the form of heat, almost sufficient to fully satisfy the high heat demands of the sludge digestion systems as well as the various building space requirements.

While pollution control, public buildings and bridges are our chief concern, we design or supervise the design and construction of buildings for a dozen other departments because ours is the chief engineering and architectural arm of the city. We are not, however, called upon to supervise the projects of the Board of Education, the Park Department, the Transit Authority nor the Department of Marine and Aviation. These departments have their own engineering and architectural staffs or employ outside agencies.

City departments and agencies which sponsor our activities, in addition to our own basic responsibilities, include the following:

Correction, Fire, Hospitals, Health, Libraries, Markets, Medical Examiner, Police, Sanitation, Traffic, Welfare, Water Supply, Gas and Electricity, and, upon occasion, others such as the Department of Commerce and Public Events, for which we built an Information Center last year at the Crossroads of the World, Times Square.

One of our most rewarding achievements has been the complete rehabilitation of our beloved City Hall.

I referred earlier to the ravages of time and neglect, but purposefully I make the point that no deliberate fault is to be found; usually it just happens that way.

Our City Hall, a 150-year-old building intimately steeped in the lore of historical New York, a landmark familiar to generations, the embodiment of cherished claims to self-expression, civic pride and individually representative of architecture, had to be preserved for generations to come.

What we did and how it was accomplished was the subject of an illustrated publication sponsored by the Downtown Manhattan Association in conjunction with the Department of Public Works entitled, *The Renascence of City Hall*, which was commemorative of the rededication on July 12, 1956.

In it was told how our respect for tradition and our patient concern for detail combined to reproduce with fidelity the pure design which distinguishes our center of municipal and public life.

Age and the elements had caused its appeal to diminish, its lines to change, its beauty to fade and its stone to crumble, but engineering and architectural skill and ingenuity surmounted the problems of faithful replacement because we were determined to live up to the expectations of the Mayor, the Board of Estimate, the Art Commission and the public.

THE renascence of New York's City Hall was accomplished within the Capital Budget allocation of $2,250,000. It has been restored to its original glory and with specifically prescribed care will defy the ravages of time.

Brooklyn Bridge, its Manhattan Plaza but a stone's throw from City Hall, is another example of rehabilitation which it has been my good fortune to supervise. Deep and sincere admiration for its engineer-designers-builders never could be exaggerated because their accomplishment—and in this instance the Roeblings, father and son, were as one—was long regarded as the Eighth Wonder of the World.

However, there came a time, almost seventy years later, when its original design for the benefit of horse and carriage, cattle, and a single cable car, had to be revised to accommodate powered vehicular traffic.

During intervening years, modifications had been made to assign space on the span to rapid transit as well as trolley cars, but in time the elevated trains of the rapid transit lines were eliminated and eventually it became apparent that the trolleys had to give way to the crush of vehicular motor traffic.

Work was begun in 1950 to reconstruct that portion of the bridge which was accessible to the motoring public, with trucks and buses to be barred in deference to a design which would permit 35-mile-an-hour traffic flow.

The reconstruction was effected at a cost of $7,000,000 even as traffic movement from Brooklyn to Manhattan in the morning rush hours and from Manhattan to Brooklyn in the afternoon and evening hours was maintained, first on one roadway and later on the other, until the entire project was completed.

The normal vehicular flow pattern was re-established in May, 1954, but was again interrupted when it became possible to finance the plan we had predesigned for the Park Row terminus in collaboration with the Borough president of Manhattan for speedier dispersion of south- and north-bound traffic at grade, as well as a corelative pattern in Brooklyn, linked with the Brooklyn-Queens expressway which is still under construction.

Those approach patterns were completed ahead of schedule this year, thereby adding immeasurably to the modernized efficiency of the 75-year-old Brooklyn Bridge, oldest of the East River suspension spans. Though it was conceived, designed and constructed in the horse and buggy era, it is nevertheless a marvel of the modern age because at relatively small expense its capacity has been doubled.

To my mind, the Brooklyn Bridge links not only the boroughs of Brooklyn and Manhattan but links engineering of eighty years ago, when it was conceived, with engineering of eight years ago when its modernization was plotted in the Department of Public Works and its capacity for fast vehicular traffic was increased by one-half.

Additional facilities on the Queensboro Bridge, also completed this year, did as much for Long Island-Manhattan traffic but, because Queensboro is not a suspension span, similar engineering problems were not encountered.

Growing pains have choked the Harlem River Bridges, too, and because we are dependent upon the mainland we must modernize those arteries. Here again the engineer must be mindful of economics, community relations, the city's expansion and a number of other considerations, not the least of which is fiscal limitations.

The Department of Public Works is not required to meet or overcome fiscal problems directly. They are the direct concern of the City Planning Commission, the Board of Estimate, the Director of the Budget, the Comptroller and of Mayor Wagner.

Though far from the breaking point, New York City is faced with fiscal problems this year which necessarily call for retrenchment. I have advanced a healthy program for 1959 which I believe is absolutely essential, knowing, however, that at least part of it must be deferred at least temporarily because of the municipal austerity program.

Fixed charges, limited revenues, prior commitments and previously deferred essential developments and many other considerations fix the fiscal policy, but given the funds, the Department of Public Works is prepared to meet any engineering problem. We have the know-how and that is the task assigned to us by the City Charter.—**End**

LINDVALL

(Continued from Page 29)

academic degrees; and, for the man who continues his career within the company, he *has* recognition.

Within the last two years, General Electric has expanded its educational opportunities by arranging part-time graduate study programs for a limited number of engineers at colleges near certain of the company plants. With the rapid growth of the company and the policy of decentralization, internal educational programs are more difficult to administer uniformly. Also, the competitive value of a part-time degree program has come to be important in recruiting young graduates.

These three companies have been mentioned primarily because they have been involved in post-graduate education for many years and because they have different patterns. Other companies, large and small, have various kinds of education and training available to their engineers. In some instances the opportunity is simply one of tuition refund for successful completion of any night, extension, or correspondence course which the engineer wishes to take, provided it is not completely irrelevant to the company's long-range interests. Some of the smaller companies arrange for outside consultants or academic staff members to conduct within the company specialized courses which may or may not qualify for academic credit. Some university extension divisions may offer quite a variety of courses open to the engineers of a particular company and may even assign a man or two to be in residence at the company giving some of the lectures and being available for counselling and administrative work. Well coordinated programs of this kind frequently lead to Master's degrees.

A large number of companies offer the well-known half-time graduate study programs with nearby institutions in which the employee attends school, taking approximately half of the normal academic load, either at certain hours of each day or on certain days of the week with the remainder of his time on his engineering work in the company. These programs have been quite popular and have been encouraged by the liberal attitude on the part of the Defense Department agencies toward contractor cost allowances in support of such activity.

For work beyond the Master's degree no clear patterns exist, but range all the way from tuition refund plans in which the employee takes courses entirely on his own time and does a thesis within his company employment under supervision of a professor at the college with which he is registered to assignment by the company at full salary to an academic institution where a man has already accumulated some advanced standing, in order that he may spend a full year or year and a half in residence in concentrated work on his academic requirements and thesis done at the institution. This latter procedure is probably the best educational opportunity which a company can offer an employee. Moreover, all costs considered, including loss of work efficiency under a split time work-school plan, the concentrated study scheme is probably cheaper for the employer.

The employee is certainly expected to return to his company after completing the work for the degree, and indeed loyalty and a sense of moral obligation will bring the man back. Sometimes contractual arrangements are attempted in which the employee agrees to work for the company for some period of time after the degree. However, such an arrangement is of questionable legal value and would certainly not create the goodwill that a plan based solely on moral obligation does. If the man is on the company payroll on this "detached duty," he must make the awkward move of formally resigning if he chooses not to return.

The rapid growth of industry plans for postgraduate training of engineers has not been an unmixed blessing. Critical examination shows that some of the

programs involve a rather low order of graduate work and in many of the programs it would appear that the advanced degree is the motivation, rather than the graduate education. This assertion would be denied vigorously in all quarters. However, the importance attached to a degree is all too evident in discussions or negotiations between industry and college representatives in establishing graduate programs. An extreme case of "degreeitis" exists in one community in which several industries have prevailed upon the local college to offer a Master's degree in engineering on a part-time basis, despite the fact that the school has not yet developed an undergraduate engineering program!

Another pattern of advanced study which can endanger the reputation of a college involved is the one in which the entire program of instruction, except for nominal supervision, is on the company's premises by regular company employees. The college satisfies itself as to the quality of the instruction and sets the requirements for the degree. Without doubt many of the engineers and scientists within the company who do this teaching are well qualified and would add to the prestige of a college were they on its faculty, but it is evident that the college could have grave difficulty in maintaining proper academic standards because of the evident embarrassment associated with a critical evaluation of the teaching which is done by the company men.

Another plan, an example of which was given earlier, that of the New York University operation of a Graduate Center at the Bell Telephone Laboratories, can provide excellent instruction and has the merit of being under the control of the academic faculty. One might fear, however, that company pressure for specialized work in new directions might tend to divert the programs from the breadth and generality which is characteristic of the best graduate education. This scheme also suffers in large measure, as does the one just previously described, that of loss of the intangibles which come from residence on the college campus. Something is absorbed through the soles of the feet or by osmosis. The graduate student in full-time campus residence has many educational opportunities available to him other than the formal routine of attending courses: seminars, special lectures, informal discussions with faculty members, extensive "bull sessions" with fellow graduate students, observation of research in progress and, most important, 100 per cent concentration on academic work. The old adage of "serving two masters" holds for part-time graduate study as well as anything else. The part-time graduate student has two records to keep in mind, one for his academic studies and the other for his performance on the job. There will be the very human tendency to slight one or the other of these responsibilities as pressures develop. For this reason and that of profiting from the values of campus life, some schools have insisted that a portion of the total time required for satisfying degree requirements be spent in full-time residence on campus. This is believed to be particularly important if the other portion of graduate study is at the plant or a remote graduate center.

SOME Master's degree programs require theses—others do not. The general nature of such a thesis would tend to be such that the question of where the research is done and under whose supervision the work is done is not a serious problem. However, for the Ph.D. thesis the situation is somewhat more acute. Many colleges are unwilling to accept for the Ph.D. a thesis done at the place of the candidate's employment. This may be an outmoded idea, but one of the essentials of the Doctoral thesis is that it be a piece of original work done by the candidate himself. This finished work should be subject to challenge by the academic faculty and anyone else and as such is construed as a publication without restriction. The supervision of the work by the academic faculty is nominal and takes the form of advice and counsel rather than specific instruction or direction. There is a real danger that if a part-time graduate student does a thesis in his place of employment, he may not have adequate freedom of choice of his problem nor be free of close supervision and direction during the course of the work. In fact, the thesis may be a part of a larger study which is underway in the company's laboratories and as such could not have flexibility in the investigation, with the result that important side-issues are not investigated nor promising new directions explored by the candidate. College people who worry about these thesis problems do not question the competence of the company personnel with whom the candidate is working; rather, there is the fear that the research, because of the industrial environment and motivation will be less free and less a measure of the candidate relying on his own resources. Some companies recognize these dangers and when arranging with an educational institution for inplant supervision of a thesis insist that the man's thesis supervisor be someone other than the person to whom he reports in his regular course of duty. This procedure is a safeguard, but even so considerable care must be exercised because of the rather widespread use of teams in conducting industrial research and development.

A Ph.D. candidate as part of a team is not likely to achieve an independent thesis from this work, even though it be different from that which he does in his normal employment. Again, there is no quibble with the quality of the work which industry can and does do in research. The candidate's research experience might, however, be different from what he would have gained in a completely academic atmosphere. A counter argument sometimes offered is that industry has facilities which no college could make available to the student and frequently men of outstanding professional stature who are in a position to help the part-time student. The right combination of circumstances can lead to a thesis of which the institution granting the degree can be proud. On the other hand, the school must watch this type of collaboration with industry with great care lest the difficulties of remote control lead to a cheapening of the degree. Colleges, in turn, must be careful that their own contract research as an area for thesis work is free of these same objections.

No matter how well intentioned these industry-college graduate programs may be, if the result is a

lowering of quality of graduate education, grave harm for the future will have been done. From our graduate schools will come the bulk of the future teachers of engineering and if their graduate instruction has not equipped them to be professional leaders, our present hopes and desires of raising standards in engineering education and attaining better scientific stature will have been in vain.

At all costs we must strengthen graduate work where it exists already and be sure that new excursions into graduate instruction result in high quality work. We are facing a very difficult time in that the demand for graduate instruction is increasing rapidly and the number of high-grade teachers to do it cannot be increased at nearly as fast a rate. Graduate work is more demanding in teacher time than undergraduate instruction, so that the number of teachers for a given increment in graduate students is substantially larger than needed for the same increase in the undergraduate class.

In addition, there is a need for light teaching loads and adequate facilities to permit faculty research, facilities for graduate student research, and reasonable office and study space for the graduate students. All of these compound the cost of graduate instruction. Industry has tried in various ways to help the colleges meet the staff and dollar needs which in part are occasioned by industry's enthusiasm for advanced degrees. Subsidies of one kind or another, the loan of company men for part-time teaching, the use of industry-owned facilities, gifts of loans of equipment; all of these things help, but so far fail to meet the true costs of graduate instruction. Industrial scholarships for students are excellent for the student, but actually add to the burden of cost of instruction at the college which he attends. Some companies have recognized this difficulty and have incorporated in their scholarship plans a grant to the institution to help defray some of the costs of the student's education. An across-the-board figure for my own campus, which has nearly half of the students in graduate work, shows that the cost of instruction and research from our own funds runs about three times the tuition income from these students. One cannot, of course, say that one additional graduate student adds an incremental cost corresponding to three times his tuition, but substantial increases in graduate enrollment do require additional staff, more buildings, more facilities, and a research budget to maintain the proper level of research activity and interest appropriate to a first-class graduate program. Of course, if we were satisfied to operate with little or no faculty research and confine our efforts primarily to classroom teaching of graduate students, our costs would be substantially lower. We feel, though, that this would not be proper graduate education.

All of which adds to the unhappy conclusion that if graduate instruction is to be really good, industry will be doing itself and the colleges a disservice by forcing graduate instruction faster than the colleges can meet the load with adequate staffs and facilities. The students will not get the quality of instruction they should have. Industry will not get the benefits of the best in graduate education. Perhaps the answer will lie in suggesting that industry be more discriminating in offering graduate study opportunities to its employees and limit the opportunities to a smaller, highly-qualified group and give them the chance to take their graduate work in more concentrated fashion, so that the degree requirements may be completed in a shorter time with a realization of the full benefits of nearly full-time graduate work. I suggest that we make a real play for *quality* and hope that industry will be willing to spend on a *smaller* number of its most promising men, that money allocated for degree programs.—**End.**

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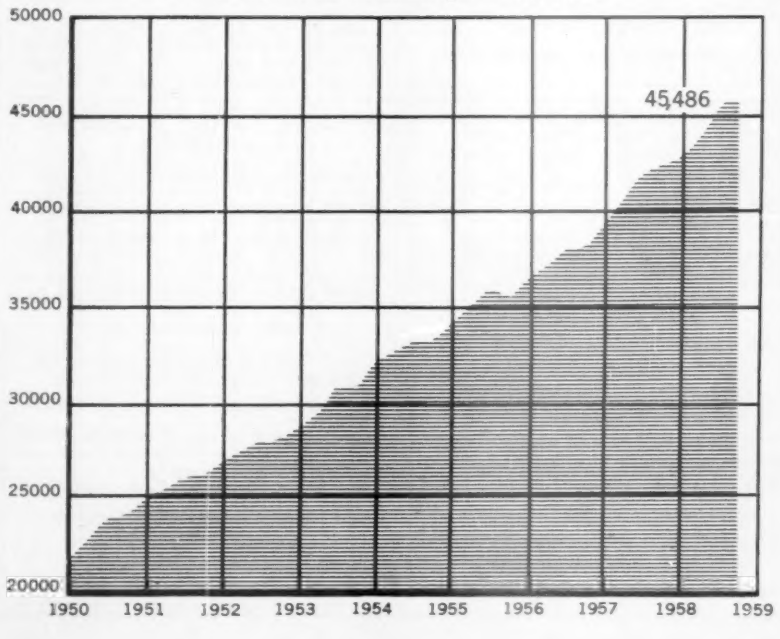

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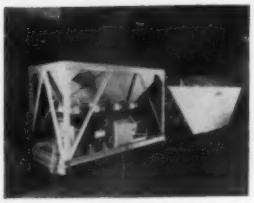
Progress in Products

BATCH PLANT — Item 30

This Model P-4150 GW aggregate bin and Model E 41B4 automatic aggregate batcher with four-pen autographic strip chart recorder is available from Blaw-Knox Co. for high speed batch plant operations in highway and airport concrete paving. It has a guaranteed hourly production of at least 180 accurate 1¾-cubic-yard batches.

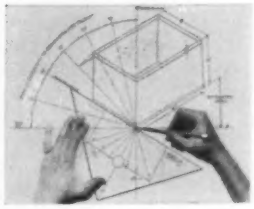


BOARD COMBINATION — Item 31

More productive use of designers' and engineers' time is the purpose of a recently announced desk and drawing board combination. The all-steel, L-shaped unit with a total of over 27 square feet of surface—divided between desk and board—provides separate, yet easily accessible work areas in a minimum of space. Top of the pedestal-type desk is 60 by 30 inches. It comes surfaced in either linoleum, maple or white pine, measuring 60 by 36 inches. It can be elevated to an angle of 85 degrees.

DRAFTING TRIANGLE — Item 32

A drafting tool claimed to reduce board time, this drafting triangle combines the functions of a drafting machine, and eliminates the use of T-square and former drafting aids. On its 14″ hypotenuse, (102 Tenite-II triangle), all baselines, perpendiculars, bi-sections, parallels, common angles and isometric projections are projected instantly with a single stroke.



LEVELING ROD — Item 33

An improved three-section Detroit Leveling Rod that features easy reading at longer distances and is "quick to operate, completely rigid and easily portable," has been developed by Keuffel and Esser Co. According to K&E, a new steel brace and locking device used to join the rod's three sections is a "tremendous advance" over previous methods. A latch type clamp on a steel brace pulls the rod sections together in metal-to-metal contact uniting the sections in virtually one continuous piece.

FLATFILE — Item 34

Ross-Martin Company announces a Flatfile for filing large "can't-fold" plans, tracings, maps and blueprints of sizes up to 33″ x 42″. This four-shelf, sturdy all-steel file has a lock-equipment disappearing door to give unhampered access. Also available are jumbo Flatfile folders of jute board, with cloth hinge and metal insertable tab attached to the front side for content indexing.

ROAD ROUGHNESS TESTER — Item 35

An inch by inch profile of the surface of a road, airstrip, or pavement area is now available in permanently recorded form, with the announcement of the availability of the Model CT-444 Road Roughness Indicator by Soiltest, Inc. Using the Indicator, the results of roughness measurements for types of pavement surfaces used on highways, city streets, airstrips and floors are reported, analyzed and correlated with the design features, age of the pavement and methods used in constructing these surfaces.

TRAFFIC COUNTER — Item 36

Fischer & Porter Co. announces a new digital recorder for traffic counting. Traffic flow during any preselected time interval may be readily measured. Operated by electrical impulses from a conventional road treadle, the recorder produces a permanent record on punched paper tape. The recorder is interpreted visually or is suitable for use with automatic data processing machines.

TRIANGLES — Item 37

Alvin & Company, Inc. offers fluorescent protractor triangles fabricated from clear optical grade Plexiglass which eliminates all distortions, it is claimed. Fluorescent acrylic triangles embody all the qualities of clear acrylic. They reflect an orange tint and have the unique feature of illuminating an orange light from all edges. Beveled protractor edges eliminate any possibility of parallax lines. Material is highly ductile, rigid and shatter-resistant with a thickness of .100 of an inch.

This column describes new products of general interest to professional engineers. For further information, circle the item number on the Readers' Service Card and mail to AMERICAN ENGINEER.

These listings are informational and are not an endorsement of the products, nor of the manufacturer's claims.

EUGENE B POWER
UNIVERSITY MICROFILMS
313 NORTH FIRST ST
ANN ARBOR MICH
COMP T 71555

A painter prompted a new look

When one of our maintenance department painters was redecorating the treasurer's office, he asked about U.S. Savings Bonds. "If I could buy these Bonds on installments," he said, "and you could take my payments out before I got my paycheck, I'd hardly miss it."

Our treasurer explained that the Payroll Savings Plan does exactly that and gave the painter an application card. But the matter didn't end there, for our painter had given *us* something, too: an idea that helped to put real color into our plan.

He made us realize that if he was unfamiliar with this plan, many others must be in exactly the same position.

Our State Savings Bond Director helped us pass the word. Under his direction, we set up a company-wide campaign that gave the whole Payroll Savings story to every person in the Company. Within a few days we had the best employee participation we've had since the mid-forties.

People are quick to take advantage of this sound, automatic way to save money. Today there are more payroll savers than ever before in peacetime. Look up your State Director in the phone book or write: Savings Bonds Division, U.S. Treasury Department, Washington, D.C.